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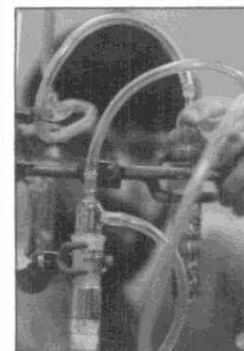
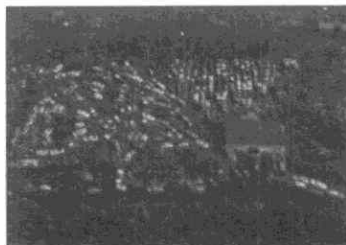


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Ontario Department of the
Environment : annual report
1971/72 /

70454

ONTARIO
DEPARTMENT
OF THE
ENVIRONMENT

ANNUAL REPORT
1971/72

To:

*The Honourable
James A. C. Auld, Minister.*

Sir,

*I have the honour to submit
for your approval the 1971/72
annual report of the
Department of the Environment.*

Respectfully submitted,

Ernest Riggs

DEPUTY MINISTER



EVERETT BIGGS.

To:

*His Honour,
The Lieutenant-Governor
of the Province of Ontario.*

May it please Your Honour,

*I have the honour to present
the annual report of the
Department of the Environment
for the fiscal year beginning
April 1, 1971, and ending
March 31, 1972.*

Respectfully submitted,

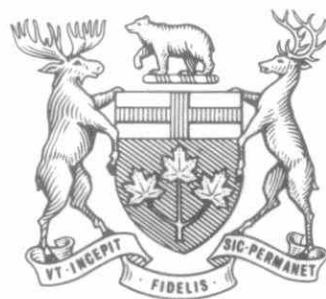
James A.C. Auld

MINISTER



JAMES A.C. AULD.

70454



Preface

In recent years, the Government of Ontario has stepped to the forefront of concerned and active legislative bodies in the field of environmental protection.

During the fiscal year 1971-72, the Department of Energy and Resources Management became the Department of the Environment. The name change reflected a shift in the department's emphasis from the utilization of natural resources to the preservation and protection of our environmental heritage.

In accord with this change is the accelerating development of a comprehensive program of environmental protection. The Environmental Protection Act, 1971, is the keystone of this program

—a firm base for regulation and enforcement by the Department.

In the course of the fiscal year, the Pesticides Control Service and the Private Waste and Water Branch joined the Air and Waste Management Branches to further consolidate the Department as Ontario's environmental protection agency.

With the fiscal year drawing to a close, the Conservation Authorities Branch was transferred to the new Ministry of Natural Resources and the Ontario Water Resources Commission amalgamated with the Department to form the Ministry of the Environment. The consolidation formed a single agency to provide the concerted action required by the demands our developing society places on our environment.

The formation of the Ministry is part of a comprehensive reorganization of the Ontario Government to meet the needs of our Province. Within the new structure, Ministries are grouped in Policy Fields to co-ordinate interrelated activities.

In the period covered by this report, the Department

of the Environment made significant strides in regulation and enforcement under the Act, with visible benefits for the environment.

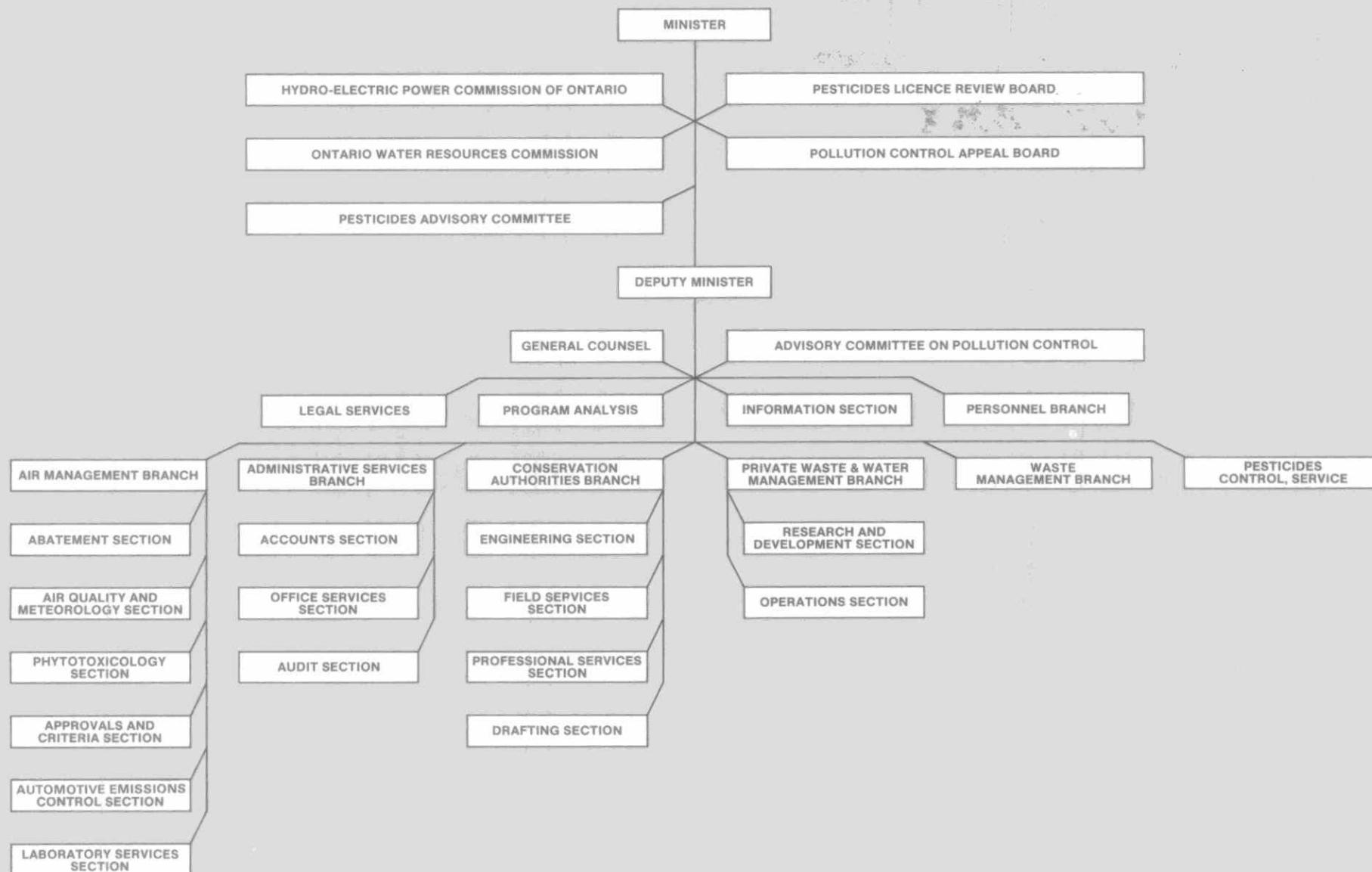
Research and development of new techniques has progressed not only within the Department but also in other institutions with Government encouragement.

Under the new structure of Government, the development of the Ministry of the Environment and its supporting legislation will continue to meet the challenge of maintaining our environmental legacy.

A handwritten signature in dark ink, reading "James A.C. Auld". The signature is written in a cursive style with a large, looping initial "J".



DEPARTMENT OF THE ENVIRONMENT ORGANIZATION CHART MARCH 31, 1972



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Air Management Branch

INTRODUCTION

The Air Management Branch continued to carry out its responsibility for establishing and maintaining a high standard of air quality in the province.

The branch's enforcement and administration responsibility under The Air Pollution Control Act, 1967, continued under new legislation since August, 1971, when that Act was replaced by The Environmental Protection Act, 1971.

The Branch operated from 15 offices across Ontario.

Most large sources of air pollution like the metal smelting industry, electric power generating plants, steel mills, foundries, and refineries are either under control or on programs that will bring them within standards.

Abatement activity has also been directed to discouraging burning waste on farms, in apartment building incinerators, in unsatisfactory municipal incinerators, and in conical wood waste burners.

The abatement program keyed to the Air Pollution Index in the cities of Toronto, Hamilton, Windsor, and

Sudbury continued to prove a useful means of moderating air pollution levels under adverse weather conditions. Part of this success must be attributed to the co-operative attitude of the owners and operators of large sources of air pollution which shut down or curtail their operations when the index climbs.

The branch's participation in international co-operation was maintained through participation in the International Joint Commission and in dealings with U.S. authorities on common problems in the southern Great Lakes areas.

Over the past year some 3,500 automobiles were tested across Ontario, assessing the effectiveness of pollution control devices in actual use. In addition, tests were run on fleet cars operating on natural gas or liquefied petroleum gas to gain background information on the feasibility of fleet use of low-pollution fuels.

Computerized inventories of air pollution sources were conducted in Metropolitan Toronto, Hamilton, and Burlington. The computer file from this emission data is used to provide predictions of air quality in the inventoried areas to establish priorities for action.

Grants totalling \$363,000 were awarded to educational institutions and the Ontario Research Foundation for research into areas directly related to air management programs.

Abatement

The Abatement Section is responsible for enforcement and administration of the Air Pollution Control Act, 1967 and, since August 1971, also for many of the air pollution sections and regulations made under The Environmental Protection Act, 1971.

The Abatement Section is the operations section of the branch, as it prepares and enforces control programs with industry and investigates complaints by the public.

It is the largest section in terms of personnel and area coverage. It maintains around-the-clock province-wide coverage in sixteen field offices.

The work of the section falls into 5 main areas:

1. Carrying out surveys, inventories, formulating control programs, and undertaking action necessary to abate emissions of air contaminants from stationary industrial and commercial sources.
Surveys may be informal to assist a company in determining the nature, cause and extent of emissions as a step toward corrective action. They may also be formalized as a comprehensive survey under Section 83 of The Environmental Protection Act, 1971.
In addition, computerized inventories have been conducted in Metropolitan Toronto and, during the past year, these were expanded to Hamilton and Burlington.
Emission data from the multitude of sources is collected and forwarded to the Air Quality and Meteorology Section for inclusion in the computerized emission inventory file. This file is used to provide predictions of air quality in the inventoried areas to indicate priorities for abatement action.
2. Receiving, recording and acting upon complaints of air pollution from the citizens of Ontario. Every

complaint is investigated and the complainant contacted. The action taken is recorded and is followed up periodically during subsequent months to ensure continuing control.

3. Working closely with other sections of the branch. Abatement personnel, after defining an air pollution problem, will assist the company concerned and act as liaison between the Approvals and Criteria Section and the firm to ensure the installation of approved equipment. Abatement staff checks the installation of approved equipment. Abatement staff also checks the installation or operation of this equipment to ensure satisfactory operation.

Field personnel makes requests for special air monitoring surveys to provide confirmation of the presence of suspected air pollutants in the vicinity of industrial and commercial establishments. It also assists the staff of the Air Quality and Meteorology Section in the siting

and operation of the province-wide air monitoring network.

In addition, abatement personnel is responsible for instituting corrective action when the continuous monitoring data comprising any of Ontario's Air Pollution Indices indicate levels in excess of 32, with unfavorable weather conditions prevailing. At a level of 32 industry is advised, and voluntary cutbacks may be made. At a level of 50 curtailment orders of the Minister are prepared and, upon issuance, compulsory cutback is enforced.

Abatement requests investigations by the Phytotoxicology section in cases where plant damage is evident and air pollution is suspected to be the cause, or surveys of the vegetation in the vicinity of known sources of air pollutants. Abatement also investigates causes of vegetation injury found during routine surveys by the Phytotoxicology Section.

Abatement maintains highway surveillance and observations, advising the Automotive Section of the licences of vehicles suspected to violate existing regulations. Remedial action is conducted by the Automotive Section.

4. Recording and collecting evidence to institute legal action against polluters in the province. When an inspector observes a contravention of either the Environmental Protection Act or regulations, a violation notice is

served on the offending plant. This informs the violator of the time of violation, and of the section of the act or regulations which has been contravened. Prosecution may ensue, and abatement personnel act as expert witnesses when required.

5. Other activities, which include participation in committees and study groups, and special projects connected with the work of the section. These groups often involve personnel from other departments and sections within the Ministry of the Environment, or government, industrial, or community groups not within the Ministry.

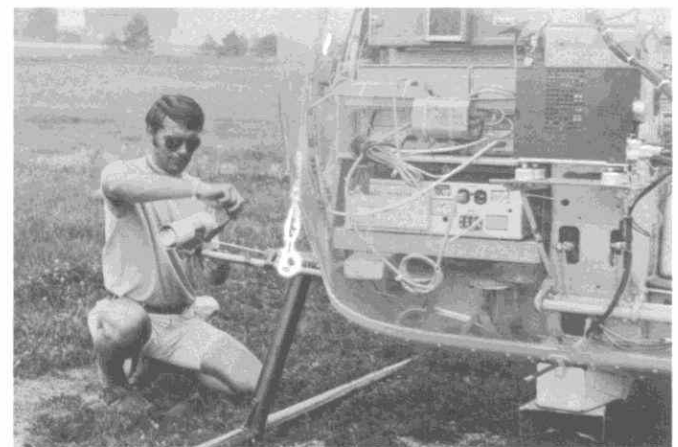
To keep the executive of the Air Quality Branch up to date, the Abatement Section regularly reports on the status of industrial and commercial programs.

Abatement assists in planning air pollution control programs with other sections of the branch to improve air quality and decrease public nuisance from air pollution. These programs are submitted to government for appraisal and approval.

Section personnel participate in public meetings and conferences as speakers, are continually answering requests for information from the public, and advise on all aspects of air pollution.

The Air Management Branch works with polluters, such as those on the opposite page, in an effort to set up and maintain abatement programs.

On the far right, a member of the air management staff prepares for an air monitoring survey from a helicopter.





Open burning at garbage dumps (left) is now controlled through programs established by the Branch.

Control Programs Instituted and in Progress in the Fiscal Year 1971/72

Control programs during the year have been directed towards abatement of industrial process emissions, such as those from public utilities, metallurgical, chemical, fertilizer and pulp and paper industries, the discouragement of waste disposal by burning (including open burning) of agricultural wastes, incineration of garbage in apartment and municipal incinerators of unsatisfactory design, and disposal of wood wastes in "teepee" or conical wood waste burners.

The Ferrous Foundry Regulations were enacted and enforced, and the regulations governing asphalt plants were enacted preparatory to the 1971 asphalt and aggregate season.

Pressure was brought to bear on industrial and commercial users of fuel, including the public utilities, to use cleaner low sulphur fuels, and the sulphur regulations for fuels used in Metropolitan Toronto became effective.

During the year, the following control programs were completed under Minister's Orders:

Chemical Industries	6
Foundries	4
Metallurgical	2
General Industry	5
Industrial Fuel Conversions	3
Lumber	2
Food Industries	3

Eleven additional Minister's Orders were served under the Air Pollution Control Act, 1967.

A further 101 foundries were brought under control under the Ferrous Foundry Regulations during the year, and 130 asphalt plants were reviewed in the light of existing asphalt plant regulations to ensure adequate controls prior to the 1972 operating season.

During the year, several of the province's 67 active woodwaste burners were closed down. Alternative means of disposal of woodwaste and bark were required. An economically viable solution does not exist in certain areas, and the section is searching for new uses or methods of disposal of woodwaste and bark.

During the year groups including the abrasive industries, pulp and paper mills, grain elevators, feed and grain mills and cement industries, were surveyed and control orders instituted or program approvals sought under section 10 of The Environmental Protection Act, 1971.

This section worked closely with the Ontario Department of Agriculture and Food on the evaluation and control of agricultural sources. A procedure for issuing Certificates of Compliance became effective.

The section continued to participate in the work of the International Joint Commission on air pollution across the Canada/U.S. border.

The co-operation of public utilities was sought in converting generating stations to cleaner fuels and of the municipalities in control of emissions

from municipal incinerators, increased garbage pickup from apartment buildings, and prevention of burning in garbage dumps.

During the year, Toronto's R.L. Hearn Generating Station completed conversion of the boilers' natural gas fuelling for base loads, with fossil fuels only for meeting peak load requirements.

A survey of the seven Toronto municipal incinerators was completed by Abatement engineers and presented to the Metro Department of Public Works. Metro Toronto approved by submission of a program for approval, which would achieve control of emissions from the incinerators by the end of 1975.

In the Sudbury basin, the nickel companies are progressing with control as required by the Orders of the Minister, and the new superstack at Copper Cliff will be operational during the coming fiscal year. Abatement personnel are participating in a special study to determine the overall and long term effects on the environment of the emissions in this area.

The refinery and petro-chemical companies in Sarnia and along the shore of Lake Ontario are progressing satisfactorily with their control programs, and the major steel companies have also made significant progress in the control of emissions from steel making.

A total of 44 companies are still working towards control under Minister's Orders issued under the Air Pollution Control Act, 1967, as amended.

The control programs instituted and administered by the Abatement Section, both voluntary and in the form of Minister's Orders, involved a total direct expenditure of \$87 million by Ontario industry during the fiscal year 1971-72.



Air Quality and Meteorology

The Air Quality and Meteorology Section's main responsibility is to monitor the air quality in Ontario. The section relates these measurements to meteorological parameters and source emission data. Where air pollution is indicated, the most effective control strategy to produce desirable air quality levels is determined.

The section continued the operation of Ontario's Air Pollution Index and Alert System in four cities—Toronto, Hamilton, Windsor, and Sudbury.

Industrial sources in these urban areas are advised immediately when pollution levels build up as a result of adverse meteorological conditions.

Voluntary curtailment of emissions is requested whenever the index reaches 32, but should the Index reach 50 and adverse meteorological conditions are forecast to persist for at least six hours, industries may be ordered to curtail their operations.

During 1971 an air quality station at Happy Valley, a community northeast of Sudbury in the vicinity of Falconbridge, was equipped with telemetering to provide an index for that area. The topography of the area is such that at times when meteorological conditions are unfavorable, plumes from nearby smelters tend to come down to ground level, causing prolonged periods of high concentrations of sulphur dioxide in the valley. Where this occurs, operations of responsible smelters are curtailed on the basis of Air Pollution Index levels and weather forecasts.

In 1971/72 the section continued to expand its air quality and meteorological network of stations. A meteorological tower was instrumented in Scarborough to measure wind direction and speed, and the temperature profile (inversions) up to 250 feet. Air quality sampling stations were added in Windsor, Welland, Peel County, Bath, North Bay and Sudbury. During this fiscal year the section had over 870 air quality and meteorological instruments in operation across the province. The map shows the locations where sampling was carried out, about

two million measurements throughout the year.

An air pollution mathematical model was developed to simulate the reaction of the atmospheric environment to emissions of various pollutants from all types of sources under widely differing meteorological conditions. The predictions of air quality produced by the simulation model are compared with Ontario's desirable air quality criteria. Various control strategies are tested to determine the best means of meeting these criteria. Some of the applications of the model during 1971/72 were to determine

- effectiveness of control of sulphur content in fuel consumed in Metro Toronto
- evaluation of Toronto District central heating plants to determine the configuration of locations and design which would be most beneficial to future air quality in Toronto
- the impact on the air quality of the city by a STOLport located on Toronto's lakefront
- the effect of a municipal incinerator at Horner Avenue in Etobicoke
- the impact of various proposals for the Metro Centre development, and the effect of existing pollution sources on the high rise buildings of the Centre
- the degree of abatement necessary for Ontario Hydro's generating stations to meet Ontario's criteria
- prediction of the air quality in Metropolitan Toronto in 1975 with all existing pollution abatement programs implemented.

The Pollutant Emission Data Information System has been extended during 1971/72 to include the Hamilton/Oakville area. As this area and others in the province are surveyed, the data are entered into the computer where they may be readily retrieved for use by management.

The section continued to provide technical consultation to all sections of the branch with regard to air quality, meteorology, data processing and the computations of diffusion equations by electronic computers. Advice about air pollution has been given to other government departments, both provincial and federal. The staff of this section have been guest lecturers at the universities of Toronto, York, and McMaster.

Scientific papers were presented during the year at the annual meeting of the Air Pollution Control Association, the Sheridan Park Association Industrial Waste Management Symposium, the American Industrial Hygiene Association conference, the Chemical Producers' Association Symposium "Industry, Ecology and Quality of Life", and the Annual Canadian Meteorological Congress.

Approvals and Criteria

The effects of economic slowdown became apparent during the second half of the year, when the number of applications received declined by 16.5%. However, the total number of applications received in 1971/72 was only 6.7% lower than in 1970/71, while the number of sources concerned rose by 31.0%.

Control equipment installed in approved industrial sources prevented the emission to the atmosphere of 1,114,163 tons/year of particulate, and 257,559 tons/year of chemicals during 1971-1972. The figures for 1970/71 were 1,017,332 (particulate) and 190,849 (chemicals).

Ontario Development Corporation

Requests for the Ontario Development Corporation for reports on companies requiring loans continue to be dealt with at a rate of 12 per month.

Section 83 Surveys, Director's Orders and Program Approvals

Approvals staff have given technological assistance to the Abatement Section in the preparation of engineering surveys, etc.

Projects

The Section is currently involved with the following projects.

Scrubber Evaluations

- a) Comparative evaluations—ignoring nucleation, etc.
- b) Definite evaluation—factors affecting agglomeration.

Water Plumes

- a) Water fallout and fog formation from cooling towers.

Combustion Studies

- a) Polychlorinated compounds and pesticides.
- b) Municipal Incinerators—Metropolitan Toronto
- c) Burner Developments—in conjunction with industry.
- c) Burner Developments—a cooperative study with the Fuel Research Centre, Department of Energy, Mines and Resources, Ottawa.
- d) Incinerators—Emission of Hydrochloric acid.

Electrostatic Precipitators—methods of assessment

Area Study Sarnia—Development and evaluation of a mathematical mini-model

Petrochemical Hydrocarbons

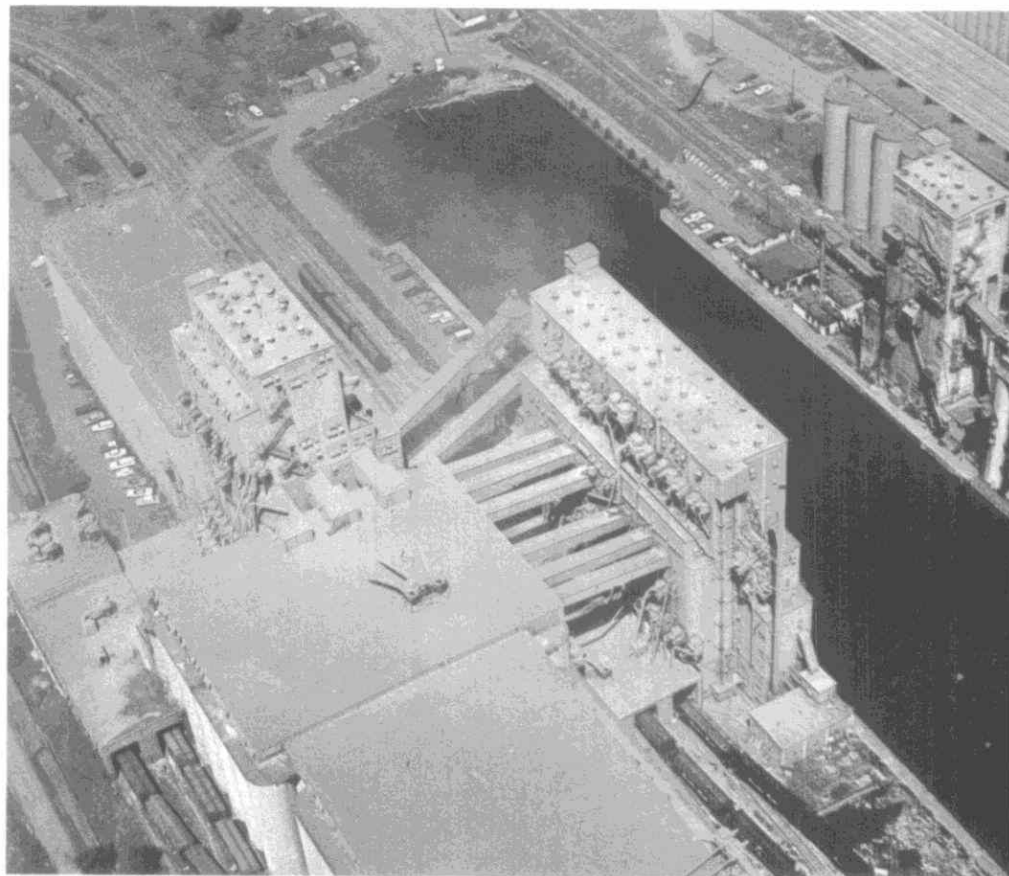
- a) With PACE committee to develop criteria and control methods.
- b) Bulk Handling Stations—with Abatement Section—development of guidelines.

Feed and Grain Mills—with Abatement Section and Industry—study of existing problems and potential solutions.

University Grants Committees

The section staff provide members for teams monitoring seven Research Investigations in cooperation with the Special Studies Group.

Pollution from grain elevators in Thunder Bay is now curtailed by special control devices approved by the Air Management Branch.



Automotive Emissions Control

During the 1971/72 fiscal year the activities of the Automotive Section concentrated on automotive testing. From May to October two mobile test laboratories visited 14 municipalities throughout the province to test automobiles for compliance with the various requirements of the automotive pollution control regulations. A total of 3,500 cars were tested.

Advance publicity was arranged by Information Services through the news media. This resulted in considerable interest in this program by the public in all the municipalities visited.

Mobile laboratories visited various colleges in the province in the course of a new program started during the winter months, to give demonstrations of the work of the section, and to illustrate the role automotive maintenance and repair can play in the control and reduction of automotive pollution. Only a few visits to colleges were planned originally, to enable the section to identify and deal with administrative problems before starting a full scale program the following winter.

However, the demonstrations proved to be so popular with college staff and students that we were obliged to extend the program immediately. In addition, the routine winter car-check program was continued at our test centre in North Toronto.

To make more effective use of both laboratories, a second Test Centre was opened in November 1971 at Horner Avenue, Toronto. This made it possible to provide facilities for special testing to assess numerous pollution control devices developed for older cars.

It also provided an opportunity to accumulate background data on the emissions of uncontrolled cars, i.e. those manufactured prior to 1969, by carrying out a program of tests on these vehicles. Throughout the year more than 6,500 routine tests were performed during regular summer and winter programs. Testing was also undertaken to assist several companies who converted a number of their vehicles to operate on either LPG or Natural Gas. These experiments were undertaken by the companies to gain background information on the feasibility of operating their urban fleets on these low-polluting fuels.

During the year the section took delivery of two new smoke-opacity meters. These will enable staff to assess diesel smoke emissions much more accurately than previously possible, and could make possible the introduction of satisfactory standards and legislation for control of excessive diesel smoke emissions. The meters also provided an opportunity to assist a number of

transport companies in assessing the performance of a diesel fuel smoke-suppressant additive. This program is continuing.

The section has also taken delivery of a number of small portable analyzers. This has enabled us to evaluate more fully a rapid test procedure in the hope of applying it to check all motor vehicles in the province on a regular basis.

Air Management crew, working from a mobile testing van, checks a car's exhaust emissions.



Laboratory Services

During the fiscal year 1971/72 the Air Management Laboratory has been re-organized and re-located in new quarters at 880 Bay Street.

The laboratory provides analytical chemical services to various sections of the branch. A field investigations unit conducts short-term surveys for special air contaminants. Research on new methods of sampling and analyzing pollutants is also carried out.

The total number of analyses performed by the laboratory has risen by 100% over that of the previous fiscal year, to a total of 60,000. The increase in output has largely been brought about through relocation, the use of automated equipment, and the streamlining of procedures.

Field Investigations

A mobile van was acquired and outfitted, and surveys were made of atmospheric mercury levels in Metropolitan Toronto, Hamilton, Cornwall, Red Lake and Thunder Bay. A survey was also made in the Marmora area for sulphur trioxide aerosol. Basic equipment has been obtained for stack sampling, and training exercises in the use of the equipment have been initiated. Analyzers using newly developed devices for detecting hydrogen fluoride and hydrogen sulphide gases have been evaluated.

Heavy Metals Survey

Analyses have been made of metals, sulphate, and nitrate in selected suspended air particulate samples collected by the network of high-volume samplers distributed throughout the province.

A total of 23,500 analyses were performed, largely by use of atomic absorption techniques, and the metals determined included arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel, vanadium and zinc. The results of the analyses are currently being evaluated by medical and air quality personnel.

Polynuclear Hydrocarbon Survey

A laboratory program to develop feasible analytical procedures for organic carcinogenic air pollutants has progressed to the point where separation of benzo(a)pyrene and benzo(k)fluoranthene by simple column chromatography has now been demonstrated. The extracts are analyzed by means of a spectrophotofluorimeter.

The levels of these two pollutants, obtained from 80 particulate samples, have now been determined in the air of eight Ontario cities over a period of five months.

Air Quality Monitoring Network

The number of samples analyzed as a service to the Air Quality Section totalled 2,940 lead peroxide sulphation candles and plates, 2,060 dustfall samples, 1,200 lime fluoridation candles, and 4,700 high-volume particulate dust loadings.

In addition, many special analyses, such as sulphate, nitrate, fluoride, calcium, iron and coal in dustfall samples were requested and reported.

Vegetation and Soils

The vegetation and soils analysis group of the laboratory received requests for the analysis of 8,600 samples. The number of determinations carried out on these samples approximated 25,000. This number represents an increase of 25% over the number of analyses completed in the previous year.

The number of sulphur determinations requested for vegetation samples, approximately 4,700, has led to the development of a program for the analysis of this element by instrumental, rather than by time-consuming manual methods.

The program includes a comparison of results obtained by the standard "Association of Official Analytical Chemists" method, by oxygen-flask combustion, and by X-ray using a newly acquired fluorescence spectrometer. To date, about one-third of the initial work, based on examination of 20 species of vegetation, has been completed. Results have to date indicated that the non-destructive X-ray method compares most favorably with the official method. The work is extending past the end of the fiscal year.

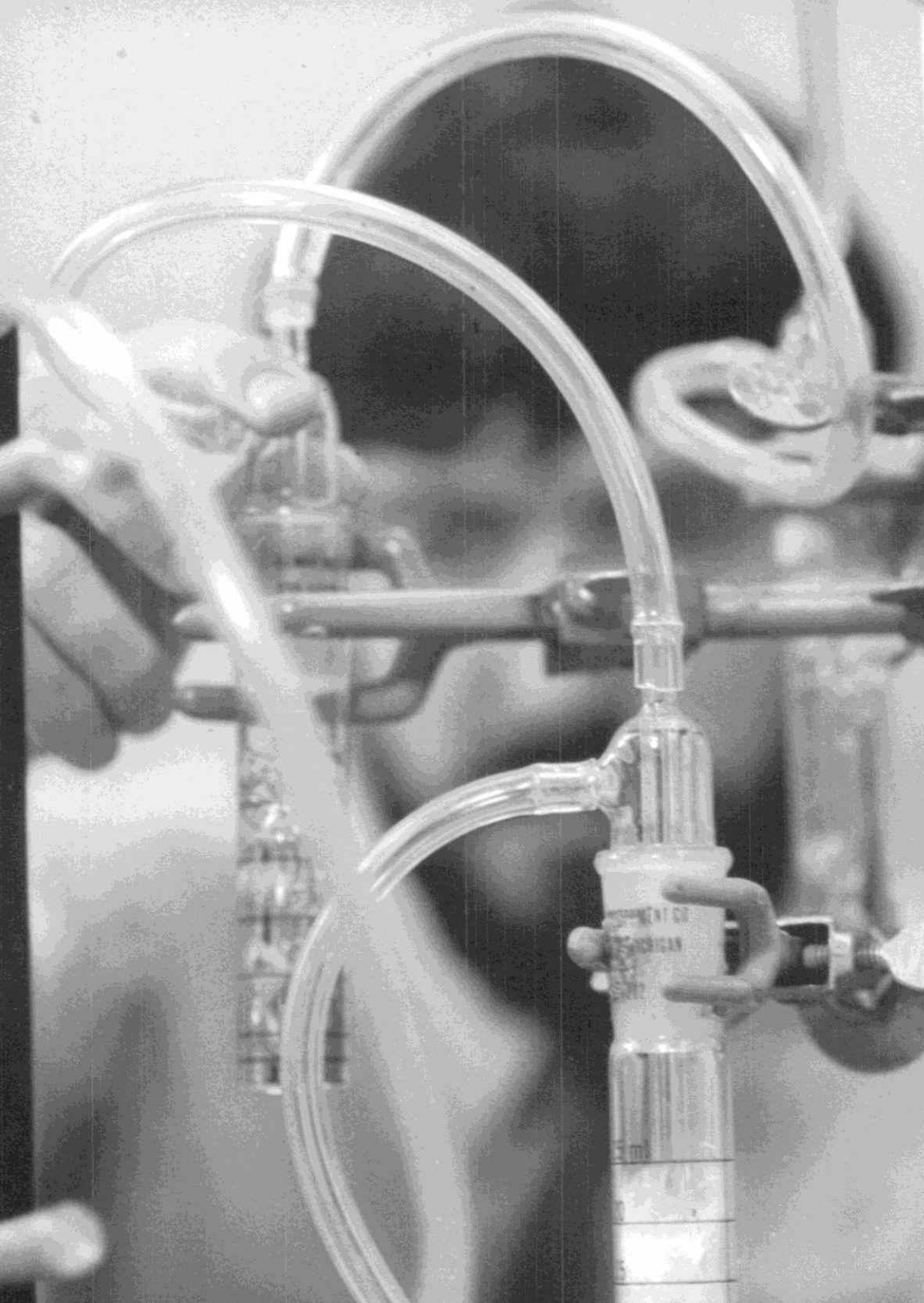
Complaint Samples

A total of 125 samples, largely a result of air pollution complaints, were submitted for laboratory examination by the Abatement and Approvals Sections.

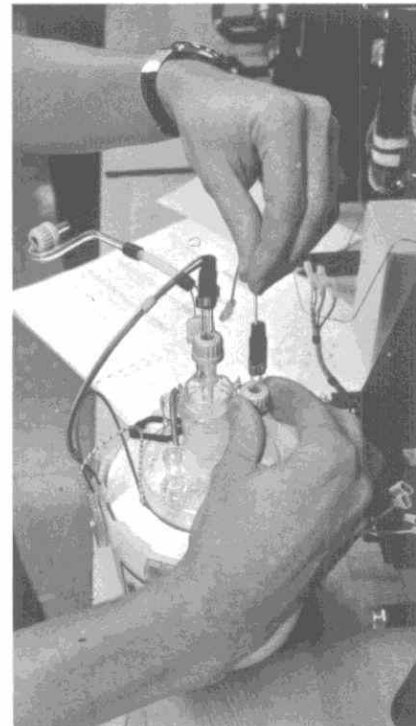
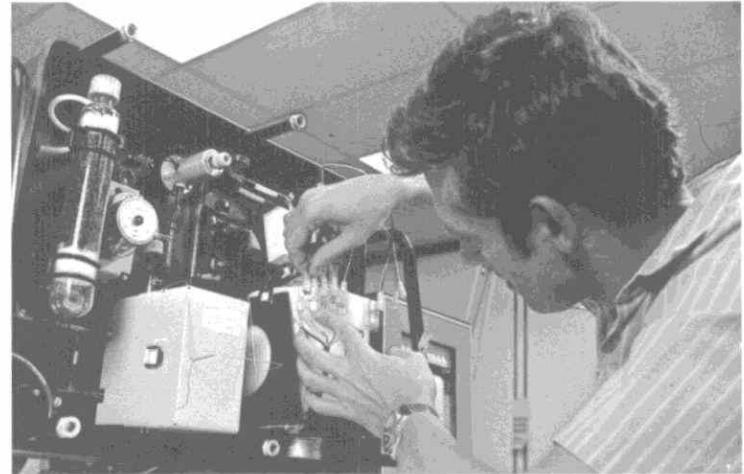
Samples of this type required critical individual attention. A total of 198 analyses, including 68 microscopic determinations, were carried out on the samples. In the previous year 44 complaint samples were examined. A procedure to determine the presence of asbestos fibres in several samples was investigated in co-operation with the Ontario Research Foundation.

Laboratory Tours

Many students from schools and universities expressed interest in air pollutant analysis, and have been shown through the laboratory facilities.



Extensive research and analysis into air pollution problems is carried out by Laboratory Services.



Phytotoxicology

The principal objectives of the Phytotoxicology Section are to determine the degree and extent of air pollution injury on all types of vegetation throughout Ontario. The data on vegetation effects together with air quality measurements form the bases for abatement recommendations.

The objectives are obtained by:

- investigating complaints concerning suspected air pollution injury to all types of vegetation, which include forests, orchards, farm crops, and ornamental plantings, in both rural and urban areas. It is necessary to differentiate pollution injury from similar injuries caused by insects, disease, adverse weather, poor nutrition, and mismanagement

- conducting ecological surveillance studies in areas of concern where adverse effects on vegetation may occur as a result of emissions from existing or future sources of air pollution
- carrying out experiments in controlled environment greenhouse and growth chambers on the effects of air pollutants on vegetation to complement field investigations.

To carry out these studies, staff of the Phytotoxicology Section consists of forest pathologists, plant pathologists, an agricultural specialist, a plant ecologist, a biostatistician, and greenhouse and laboratory technicians. The Phytotoxicology headquarter offices and analytical facilities are located in Toronto, and a northern regional office is located in Sudbury.

In the Phytotoxicology analytical facilities vegetation samples collected during complaint or surveillance visits are examined by pathological and histological techniques, and processed for chemical analysis. A herbarium is maintained to demonstrate, compare, and diagnose plant material damaged by particular air pollutants.

Studies conducted in some areas include the growing of plants in specially designed chambers equipped or not equipped with devices to filter the ambient air. Certain plant species and varieties which are especially sensitive to various air pollutants are raised in a filtered air greenhouse under uniform culture for use in experiments.

The Environmental Protection Act, 1971 has made provision for a Board of Negotiation to mediate the settlement of

claims of persons whose crops, trees or livestock are damaged by air pollution and who have thus suffered economic loss. To have the Board of Negotiation intervene in a dispute, the claimant must follow a series of steps outlined in Section 92 of the Act.

Vegetation Complaint Investigations

The Phytotoxicology Section received 121 complaints in 1970/71, and 131 in 1971/72. The number of vegetation samples taken for laboratory examination on complaint visits increased from 1,330 to 1,803. In 1970 and 1971, 49.6% and 42% respectively of the complaints investigated were confirmed as having been caused by air pollutants.

In 1971 these pollutants included sulphur dioxide, fluoride, chlorine, ozone, salt spray, nickel, cobalt, lead, ammonia, urea, atrazine, pentachlorophenol, acidic soot, magnesium-lime dust, and cement dust. Various types of vegetation were investigated, which included lawns, ornamental plants, vegetable gardens, farm crops, fruit and forest trees.

In southern Ontario, the largest number of complaints was received from the Port Maitland area. A total of 25 complaints was received from 15 residents, 11 concerning vegetation and 14 concerning animals. As a result of the 11 vegetation complaints 41 vegetation injuries were examined, of which only three were found attributable to atmospheric fluorides. A total of 74 animal feed and water samples were collected on the 14



Field crews (opposite) investigate possible air pollution damage to vegetation.

animal complaint visits. Chemical analysis revealed that three of the feed samples contained fluoride in excess of 35 ppm, the criterion recognized by the Air Quality Branch.

Nine of the livestock complainants were included in a cattle and swine reproductive study which was undertaken in co-operation with reproductive consultants from the University of Guelph, veterinarians from the Veterinary Services Branch of the Ministry of Agriculture and Food, and personnel from the Phytotoxicology Section, Air Quality Branch. The study revealed that there was no widespread infertility in any of the herds examined, and that reproductive problems of individual animals were not related to fluorosis.

In northern Ontario, the largest number of complaints were received from the Sudbury area. On thirteen complaint visits to investigate suspected air pollution injury, 60 vegetation samples were collected for laboratory examination. Of the 13 complaints, 10 were diagnosed as being caused by sulphur dioxide.

A number of complaint disorders investigated were found to be attributable to causal agents other than air pollutants. These included diseases, insects, nematodes, mismanagement, physiological disorders, and adverse weather.

A report of the investigation in which air pollution is diagnosed as the causal agent is sent to the complainant and the alleged source. Many of the complaints are settled prior to any claim being

made to the Minister for mediation by the Board of Negotiation. In 1971-72, the board heard claims from eight growers.

Vegetation Surveillance Investigations

Ecological surveillance studies were conducted in the vicinity of several industries in Ontario in 1971/72. The studies were conducted to determine whether adverse effects occurred in these areas as a result of industrial emissions. If the vegetation data in conjunction with air quality records demonstrated ecological deterioration, the abatement force of the Air Quality Branch was promptly notified.

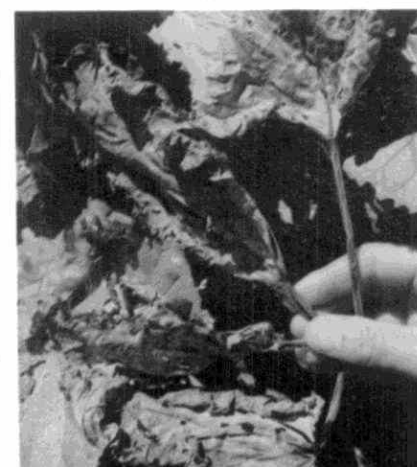
Vegetation studies were conducted in the vicinity of industries under abatement orders to determine whether beneficial effects were occurring as a result of the control orders. In addition, pre-pollution background studies were undertaken in areas where industries propose to construct new major operations.

In 1971/72 major vegetation surveillance studies were carried out in the vicinity of fertilizer manufacturers at Courtright and at Port Maitland to determine the degree and extent of fluoride injury on crops in these areas. Fluoride studies were carried out also in the vicinity of aluminum refineries (Cornwall), a hydro-fluoric acid plant (Amherstburg), and a fibreglass manufacturer (Guelph). Trace metal (lead, mercury) contamination of soil and vegetation was investigated in particular locations in southern Ontario.

A comprehensive surveillance study was conducted throughout Metropolitan Toronto (65 soil and vegetation stations) to determine areas of contamination. The effects of sulphur dioxide and heavy metals on forests in northern Ontario were studied in the vicinity of an iron concentrator at Wawa, and nickel and copper smelters at



Tomato (above) and rhubarb plants show effects of air pollution.



Sudbury. Arsenic effects were investigated in the vicinity of iron pelletizers at Atikokan and gold mines at Red Lake.

Pre-pollution baseline studies were conducted during 1971/72 in the Nanticoke area (sulphur dioxide and ozone) in southern Ontario, and in the Timmins area (sulphur dioxide and heavy metals) in northern Ontario. In the rural farming area near Nanticoke, Ontario Hydro is constructing a thermal generating plant of 4,000 megawatt capacity.

Other major industries, such as a steel company and a petroleum refinery, have purchased land adjacent to the power plant to build new facilities in preference to constructing in overburdened urban areas. In a forested region near Timmins a mining company is constructing an electrolytic zinc plant (smelter and refinery) in the vicinity of a huge orebody, to process the raw materials locally.

The Phytotoxicology pre-pollution ecological studies are designed to document the natural endemic conditions in the areas to detect future adverse effects on soils, crops and forests in the vicinities of the industries after start-up.

The total number of surveillance station visits increased from 626 in 1970/71 to 918 in 1971/72. The number of vegetation, soil, and water samples taken during these visits increased from 3,329 to 4,493.

Conservation Authorities Branch

Introduction

The Conservation Authorities Branch administers the Conservation Authorities Act, and aids conservation authorities—the basic working units—in establishing and directing environmental conservation programs in Ontario's river basins.

At present there are 37 conservation authorities in Ontario covering the majority of southern Ontario and the more urbanized portions of northern Ontario.

Conservation authorities are autonomous in nature and free to develop their own conservation programs. However, because government financial assistance is available to aid in implementing these programs, the branch scrutinizes each project to ensure that provincial finances are spent wisely.

The basic concept of the conservation authority approach to environmental conservation requires local initiative, involvement, and participation in conservation works. In this way local communities can set priorities for and react to their resource problems.

With watersheds as the areas of jurisdiction, conservation authorities were in an ideal position to establish comprehensive water management programs to provide optimum sustained flow of high quality water while minimizing damage and erosion caused by flood waters.

Conservation authorities, adequately structured to combat water management problems, gradually broadened their direction to other resource oriented problems until today they are involved with the provision of resource-oriented recreation areas, open space, fragile land protection, and provide local input to land use planning decisions. In addition, many authorities developed outdoor resource-oriented educational programs in conjunction with local educational institutions.

The branch also administers the Parks Assistance Act through which municipalities can obtain financial assistance for the acquisition and development of certain parks.

HIGHLIGHTS

During the fiscal year April 1st, 1971 to March 31st, 1972 the Ausable River Conservation Authority was enlarged to take in those lands drained by the Bayfield River. The authority was subsequently renamed the Ausable/Bayfield Conservation Authority. The Saugeen Valley Conservation Authority was also enlarged to the south-west.

Meetings were held to discuss with local municipalities the possibility of creating authorities in Essex County and in the North Bay Region.

This year marked the first time conservation authorities became involved with summer and winter employment incentive programs. During the summer approximately 1,100 students were employed throughout the province on conservation authorities' S.W.E.E.P. projects. In the winter approximately 1,200 persons were employed on a winter works program.

The conservation program continued, characteristically dominated by the water management component of the program. Additional land was acquired for recreational use, and at year end 270 conservation areas were available to the public.



Above: Environment Minister George Kerr opens the Scotch Block Dam in the Halton Region Conservation Authority.

Right: Natural beauty, such as this forest glen, attracts nature lovers to Ontario's conservation authorities.



Biology

During the formative years of the Conservation Authorities Branch this section was identified primarily through its fish and wildlife programs. However, the early 70's revolutionized our approach to the natural environment.

Diversity is becoming the byword as traditional fish and game programs are extended into other facets of natural systems. Basic, sound programs of land acquisition are not ignored, however, and several authorities continued to purchase portions of wetlands, bogs, and important fishing streams during 1971.

However, it is quite evident that land acquisition is not an adequate answer. The Hamilton Conservation Authority is exploring the possibility of providing trout fishing easements for the public by entering into agreements with private landowners along Spencer Creek. Habitat improvement will provide a greater number of fish per mile of stream, with the result that the landowner's fishery becomes more valuable and the angler catches more fish.

Of course, some authorities are

taking advantage of the Dept. of Lands and Forests' Wildlife Extension Program. Under this rather farsighted program maximum use is made of all wildlife habitats and compatible recreational pursuits to utilize the natural environment without severe conflicts. As most authorities do not employ wildlife managers, they might be wise to take advantage of this program.

During 1971, the Credit Conservation Authority agreed to manage the Orangeville Reservoir in this manner.

Authority forests have undergone a major change in use philosophy. Instead of remaining solely in timber production, they are now gaining acceptance for additional uses. Wildlife habitat, never a consideration of timber managers, is now being created in the form of cottontail rabbit brush-piles, and barren forest edges are being planted to shrubs. The Grand, Long Point, and Nottawasaga Authorities have been especially active in this regard.

Although most authorities collected routine water samples for the Ontario Water Resources Commission as part of a co-operative province-wide monitoring program, two authorities have been especially active in water quality programs of their own. The Grand Authority, with its fine technical field operation, has initiated a program which will sample stream invertebrates, in order to relate stream and lake productivity to water quality.

Because aquatic insects and crustaceans are extremely sensitive to water chemistry changes, the influx of domestic or industrial effluents into streams may drastically alter the stream's ability to produce aquatic life. An accurate appraisal of the authorities' waters can be made as a result, and changes and fluctuations due to water quality can be tabulated. The Rideau Authority embarked on a chemical weed control program on the Rideau Canal to evaluate the effectiveness of herbicides on submerged macrophytes. The next phase of the program will evaluate mechanical weed removal in recreational waterfront areas.

Since water bodies are an integrated part of many conservation areas, it is logical that waterfowl habitat should receive considerable attention. The upsurge of wood duck and Canada goose nesting projects has been phenomenal. The Saugeen, Metro Toronto, and Grand Authorities have been the forerunners until 1971, when the Halton, Rideau, Credit, North Grey and Long Point Authorities developed their own well-conceived programs. Research done by Laurentian University on the Junction Creek Authority properties led to the design of an excellent duck nesting raft.

Much has been accomplished to date, but the next few years will decide whether the natural resource base is adequate for future generations. Integrated planning with other agencies is now more essential than ever before, due to the tremendous recreational pressure exerted on land and water today.

Streams must not be managed for flood control or low-flow augmentation without investigating the program's impact on aquatic organisms. Drainage schemes need to be examined carefully to assess biological impacts. Cattle grazing on streambanks increases erosion and deteriorates stream quality, thereby altering sport fishing potential. These and many other projects need to be scrutinized by the conservation authorities during the years to come.

Canada geese are becoming permanent residents in some Southern Ontario conservation authorities.

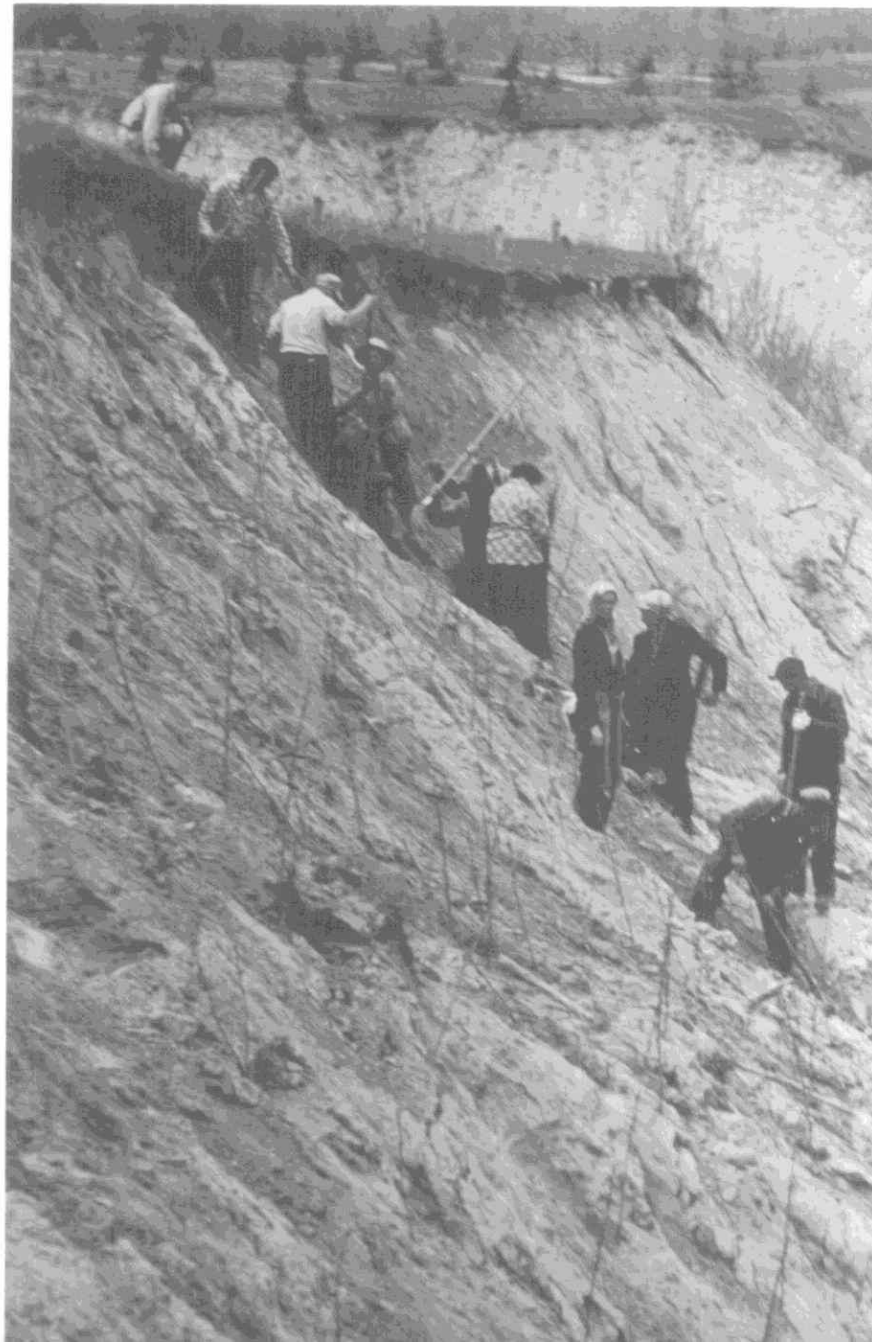


Forestry and Land Use

The survey and report of the Niagara Peninsula Conservation Authority, completed during the year, indicate 4,390 acres of land suitable for multi-purpose conservation areas. A significant proportion of this acreage is under forest cover and would require woodlot management to support a forestry-biological recreational concept in developing conservation areas. The report also indicated potential soil erosion control projects for those locations where extensive soil cultivation operations are carried out in erosion-prone areas.

Forest management practices in authorities can fulfill several functions—the protection of water source areas, erosion control, the rehabilitation of marginal lands, the growing of timber and the preservation of natural timber growing potential. They also provide a natural aid to flood control schemes.

Trees planted under authority auspices serve as windbreaks and shelterbelts for farm crops and livestock yards, and they are also used for landscaping and screening conservation areas. Authority forests may consist of both natural and planted forest areas. In addition to their important water and land conservation functions they provide considerable land base for open space-type outdoor recreation, such as hunting and hiking.



Authority Forest Projects

Most forests owned by an authority are placed under agreement with the Department of Lands and Forests for management purposes. These are called Agreement Forests. Other forests not placed under agreement are called Authority Forests. This year Agreement Forest purchases made in the Long Point, Saugeen, and South Nation River Authorities amounted to 1,096 acres.

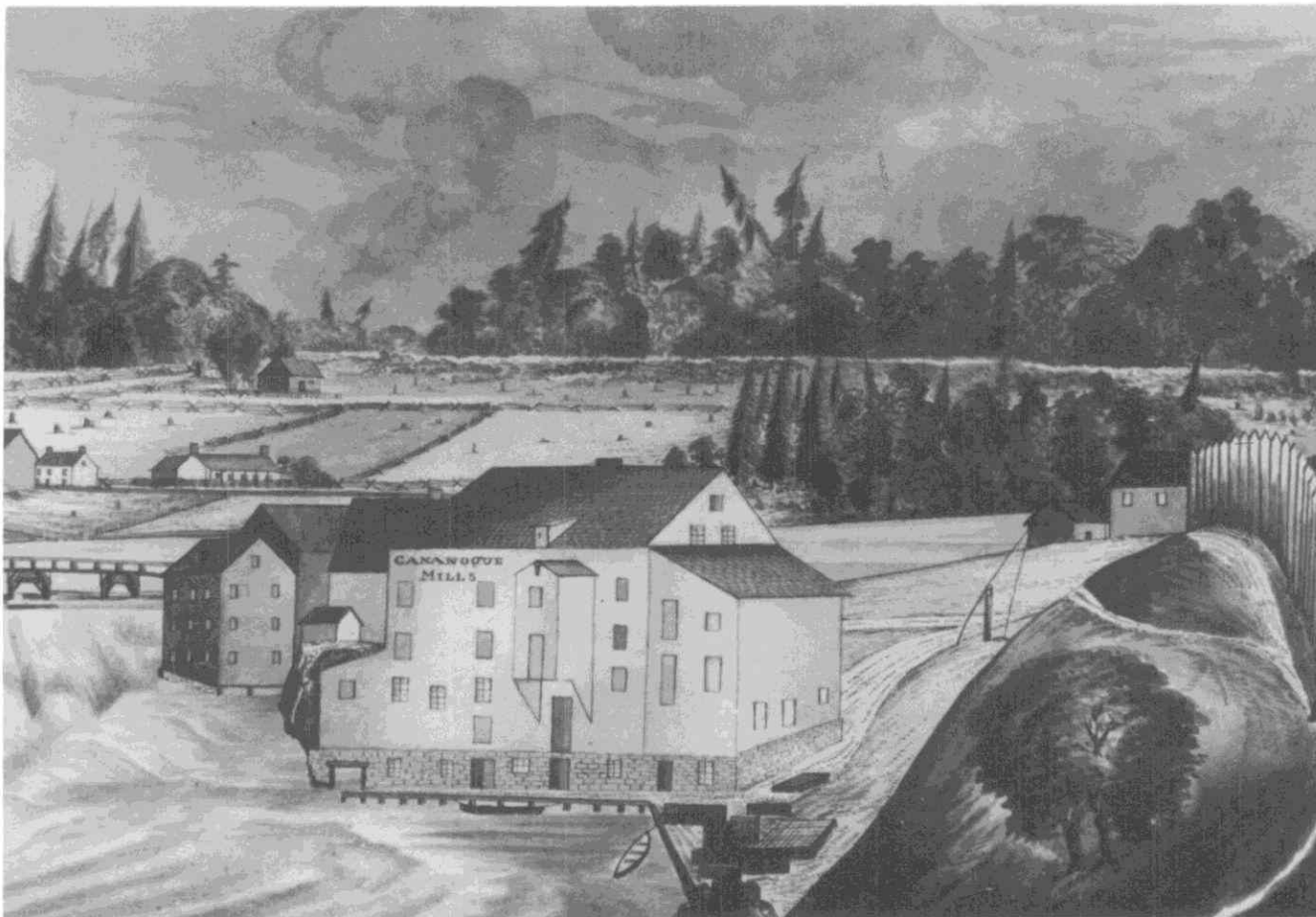
During the winter of 1971/72, under the Employment Incentive Program (Winter Works 1971/72), woodlot management projects were carried out by various conservation authorities within their respective Authority Forests. The projects included stand improvement, site clearings for reforestation, and nature trail development. The planting of trees on small tracts of privately owned lands can often contribute to conservation projects over larger areas. Participation by authorities with private land owners in tree planting projects continues to be a popular program.

Erosion Control

Grass waterways for surface drainage and soil erosion control purposes in addition to gully erosion control continue to be part of demonstration projects on authority lands. Assistance for erosion control on private lands, as demonstration sites, is also available.

A field survey crew examines the effects of erosion to suggest suitable control measures.

History



Historic sites, such as the ones above and on the following page, are bought and restored by Conservation Authorities.

The last annual report described planning for future historical projects as well as development of existing ones by conservation authorities. During the 1971/72 fiscal year the pace increased to involve 43% of conservation authorities in various stages of development of historical projects, either on their own initiative or in conjunction with other organizations. This number does not include authorities with already existing facilities that were not developed further during the year.

Projects in the confidential planning stage are not included in this report. Those completed or continuing during the year are outlined below.

The Ganaraska Authority acquired a water-powered mill originally constructed in the 1830's when it purchased the Ball Mill property at Baltimore. Saw and grist milling demonstrations during Conservation Week in September were well attended by the public.

In the Grand River Authority's Doon Pioneer Village a Waterloo County Hall of Fame was constructed to commemorate past sports achievements. It will be opened to the public in June, 1972.

The Hamilton Authority continued its historical developments in the Crooks Hollow and Valens Conservation Areas. These included mill restorations and some building reconstruction. In June, a public unveiling of an Ontario Archeological and Historic Sites Board plaque in Crooks Hollow marked the location of the first paper mill in Upper



Canada. Renovations at other sites, the Woodend and Hermitage properties, were in the early stages.

Development continued of the historic area of the Long Point Authority's Backus conservation area.

With the help of local Indian groups, the Lower Thames Authority's Longwoods Road Indian village has been growing rapidly. A palisade and a longhouse have already been constructed as part of the intended complex. The authority is also undertaking preservation of an early 19th century lighthouse which once guided ships at the mouth of the Thames River.

The Lower Trent Authority has given

Old mills, such as this, are favorite restoration projects.

support to a local group that is restoring the century-old Proctor House at Brighton.

Additions to the Metropolitan Toronto Authority's Black Creek Pioneer Village, either underway or completed, include a print shop (officially opened at a public ceremony in June), a gunsmith shop, a stable and driving shed, a doctor's home and office, a beef ring building, a sawyer's home, a sawmill, a school and teacher's home, a manse, a toll gate house, and a weaver's shop. Many of these buildings must be moved over long distances.

Expenses at the village led the authority to create a Black Creek endowment growth fund. Some 450 articles were donated to the village. Nearly 35,000 students visited the area from April to September alone.

Pioneer crafts exhibits were staged both in the pioneer village and elsewhere in the authority area. The authority also sponsored a book on pioneer gardens, and was involved in renovating of the old paper mill at Todmorden Mills Park.

Cataloguing of the authority's artifacts and Canadiana book collections was undertaken under the winter works program by seven researchers.

After many months of effort and the involvement of a number of other agencies and organizations, the Mississippi Valley Authority completed negotiations for the acquisition of an area, including the well-known Mill of Kintail, by the end of the fiscal year. The water-powered mill, just outside Almonte, was once the studio-home of Dr. R. Tait McKenzie, famous as a sculptor, surgeon, physical educator and soldier.

The Mississippi Authority received during the year designation as a charitable organization, which will facilitate donations for historical purposes.

The neighboring Moira Authority has made necessary arrangements for the setting up of an endowment fund to finance maintenance, operation and development of the O'Hara complex which portrays the pioneer and middle

years, and Victorian periods of Ontario life. Advice on further development was received in September from the Ontario Government's senior museums advisor.

A history of the Ball's Falls area was completed for the Niagara Authority at the end of 1971. The entire contents of a blacksmith's shop were moved to the Ball's Falls area in preparation for the intended establishment of the shop in 1972.

The Niagara Authority has also been involved with the development of a conservation area to serve as a memorial to United Empire Loyalists.

Considerable rehabilitation work was done by the Otonabee Authority, with the help of students, on the Lang Mill, the Hope Mill, and the McCracken House. Placing of tile, gravel, siding, roofing, new stone, oak gears, pine timbers and covering of a flume were included.

The Rideau Valley Authority also received a provincial charter as a charitable organization, which will enable it to receive money and property for historical and educational purposes. It has two historical projects underway.

A newly erected barn in the Upper Thames Authority's Fanshawe Pioneer Village has been used for additional historical displays. The area of the existing blacksmith shop has been expanded. Remedial work on other buildings in the village, including permanent foundations, became necessary, but availability of funds from the Fanshawe Conservation Area's operating surplus limited building rehabilitation to one building at a time.

Information and Education

Conservation Authorities have long been concerned with the need for a public informed about the conservation problems in their watershed or region. Minutes of a meeting in 1946 of the Ganaraska Authority express the concern of the members for a conservation education program in schools.

All of the 37 authorities in the province now have at least some amount of education and information programming. In many it forms a very important part of their work. The Metropolitan Toronto and Region Conservation Authority, through its conservation field centres, has become widely known as one of the leading agencies in Ontario for conservation education.

Other authorities that have established field studies centres include Hamilton Region and Grand River. Both of these authorities have renovated existing buildings on conservation lands for education purposes.

Authorities with seasonal education programs (spring or fall) include Ausable, Sydenham, Niagara Peninsula, Junction Creek, Moira and Cataraqui. Instruction in these programs is usually given by staff of the school systems using them. Staff of the authorities, or of resource departments, give assistance on request.

The most important factor in authority education programs is their co-operative nature. They are joint operations between the authority concerned and the participating school systems. Financial arrangements vary;

in the more comprehensive programs participating schools pay all or part of the cost of the program to the authority.

Still other authorities have organized bus tours through their watersheds, visiting conservation projects. In 1971 more than 30,000 elementary and secondary students participated in one kind or another of authority-sponsored conservation education program.

An increasingly popular springtime activity in over a dozen authorities is the maple syrup demonstration. Popular with both students and adults, these activities are operated either on authority-owned maple woodlots or through agreements with private landowners.

Other education programs include authority-sponsored 4-H Clubs, instruction assistance to Scout and Guide nature activities, and field tours for university students, and high school geography, science, and nature classes.

Education activities for adults are important, too. These include providing speakers, slide programs and conservation films to many groups. Senior citizen groups have received special attention from such authorities as Metropolitan Toronto and Region, Hamilton, and Grand.

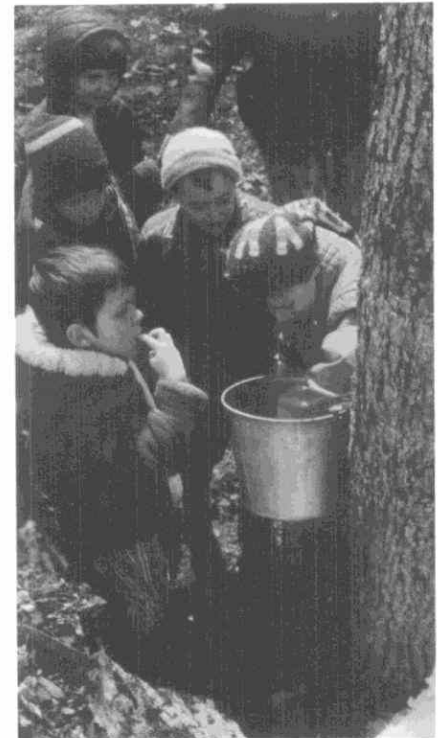
Interpretive programs in the form of nature hikes, exhibits and displays in conservation areas combine some education with the recreational activities of thousands of visitors to conservation areas.

Exhibits and displays at field days, fairs and exhibitions have always been important means of reaching the public.

Nor are the media of radio, television and the press ignored. Several authorities provide radio tapes and shorts for television use. Both private radio and T.V. and the public network have been generous in supplying radio and television time without charge.

The Grand River Authority has a 20 minute film on their program in production for completion early in 1972. Several other authorities have films under consideration.

"Valley News" produced by the Grand River Authority and the "Conservationist" from the Junction Authority are examples of periodicals produced for public information purposes. Other authorities publish well illustrated annual or biennial reports. Information brochures on conservation areas or on private lands assistance programs are distributed widely. In 1971 some 500,000 brochures and reports were distributed for public information and education purposes.



Above: Children taste maple syrup at an authority demonstration.



Below: Sweep crew (Students Working for the Enhancement of the Environment—a government sponsored project) cleans up a river.

Parks Assistance Act

The Parks Assistance Act, as passed by the Ontario Legislature in 1960, made provision for payment of grants to municipalities of 50% of the cost, up to a maximum of \$50,000, of acquisition, planning and development of municipal parks as public recreation areas which are complementary to provincial parks.

Legislation passed in 1966 increased the maximum total grant for any one park to \$100,000, with the provision that the assistance granted for the acquisition of land may not exceed \$25,000.

Under a 1962 amendment to the Act, Indian bands are permitted to participate in all benefits available under the Act. This places at their disposal, on the same basis as for urban and rural municipalities throughout the province, financial and technical assistance for

development of revenue-producing camping, picnicking and recreational areas on Indian reserve lands.

To qualify for a grant under the Act, a municipality must provide sites for overnight tent and trailer camping, a supply of safe drinking water, picnic and sanitary conveniences, entrances controlling admission to the park, and collect fees which are not less than those charged in provincial parks.

However, under a 1967 amendment to the regulations under the Act, these requirements may be waived where the purpose is to develop and utilize a natural beach for recreation purposes.

Other development work in these approved parks eligible for grants includes the construction of roads, picnic shelters and change rooms, as well as facilities for boat docking, aquatic and winter sports, cooking and washing.

During the 1971/72 fiscal year 18 new municipal parks were approved for assistance under the Act, of which ten provided for development of a natural beach without camping facilities. This represents an addition of some 602 acres to the publicly owned recreational land under development in the province, and brings to a total of 112 the number of parks approved for development under the Parks Assistance Act.

Out of a total of \$825,543 authorized to assist municipalities in the development of approved parks during the year, \$347,795 were authorized to apply on the cost of acquiring land and carrying out preliminary development work in these 18 new areas.

Beaches, such as this, may be developed into parks under the Parks Assistance program.



Planning

The Conservation Planning Section performs three main functions: advisory, co-ordination, and research. These are performed at various levels. The section is responsible for relating sound urban and regional planning principles to analysis and resolution of complex resource management problems.

The section is also involved with ongoing research for conservation reports. In the past year, two field surveys were completed—one in the expanded South Lake Simcoe Conservation Authority, the other in the enlarged Ganaraska Region Conservation Authority. Because many of the matters with which any conservation authority must deal relate directly to policies and programs of local municipalities, this section also reviews municipal factors as part of the studies leading to the preparation of the conservation report and plan.

Advisory technical assistance on municipal planning matters which may affect local conservation authorities is provided upon request to any authority, municipality, or public agency.

In the past year the section expanded its analysis and map inventory of 'Hazard Lands'. This map inventory is intended to assist local and regional municipalities as well as local

conservation authorities and provincial agencies to delimit physical hazard areas which may require special works or regulatory action to avoid problems of erosion, slope stability, and flooding.

This map inventory is developed through air photo analysis and verified by field checks. The section analyzed and mapped 5,400 square miles of the Toronto Centred Region area for Hazard Lands in the past fiscal year.

Additional Hazard Lands mapping was completed as background input for municipal official plan preparation, or for the review of proposed municipal official plans and draft plans of subdivision referred to the branch for review.

The staff of the Planning Section has participated in many interdepartmental studies including the Toronto Centred Region, Eastern Ontario Economic Region, Georgian Bay Economic Region, Lake Erie Economic Region, Lake St. Clair Economic Region, Niagara Economic Region, Midwestern Ontario Economic Region, Northwestern Economic Region, Northeastern Ontario Economic Region, Lake Ontario Economic Region, Wasaga Park Community Project, and special task forces.

A table included in the appendix indicates the number of subdivisions, official plans and zoning by-law submissions reviewed by the Planning Section of the Conservation Authorities Branch at the request of the Department of Municipal Affairs in the past year.

The Conservation Planning Section is responsible for co-ordinating the technical review within the Conservation Authorities Branch for these applications. The review concentrates on matters having to do with sound resources management practices as these may be effected by immediate and long range development policies and proposals. Among issues considered are flooding, erosion, extreme slope, and soil bearing deficiencies.



More attention to conservation practices by the construction company would have prevented this stream-bank erosion.

Recreation

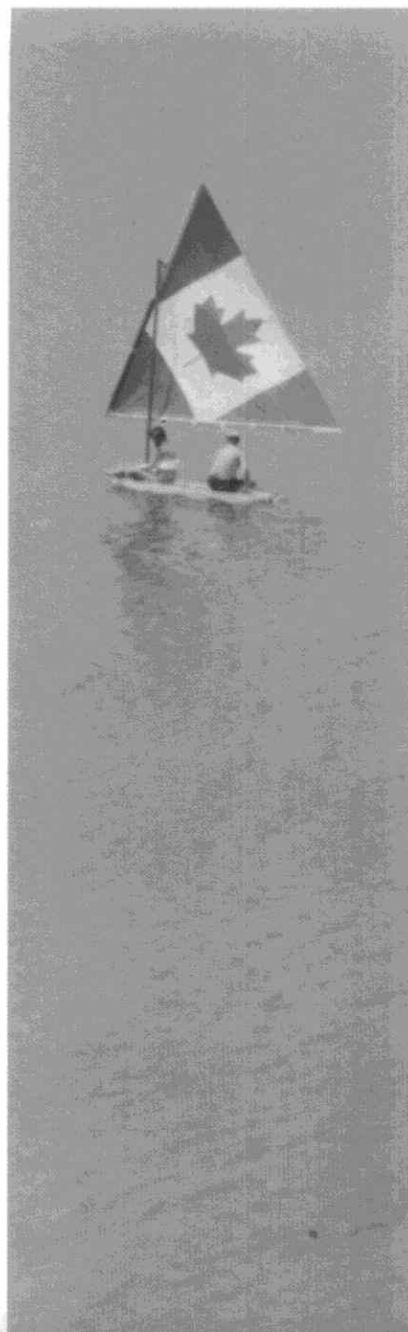


With increasing demand for recreation, the conservation authorities have been busy acquiring and developing conservation areas in 1971. Both demand and supply of recreational facilities have increased over the past few years, and it seems likely that they will continue to do so.

The emphasis of the conservation authorities is on providing day-use recreational opportunities for the population within easy one day travel distance of conservation areas. This focus, therefore, emphasized the provision of facilities for picnicking, swimming, fishing, canoeing, sailing, and nature study. However, within most of the authorities, there is at least one conservation area that provides, or is intended to provide, some overnight camping facilities for families. Group campsites catering to youths and day camps are also popular.

During the past year, the Conservation Authorities Branch attended meetings of the Ontario Parks Integration Board designed to establish goals and standards for recreation in Ontario. It also worked in mutual co-operation with the Departments of Lands and Forests and Tourism and Information.

A total inventory of conservation areas indicated over 300 conservation areas in the province. Many new areas were officially opened in the summer of 1971. The A.W. Campbell Conservation Area, in the Sydenham Authority, was officially opened by the Honourable George Kerr in June 1971. In the same month, the official opening of the Luther



Marsh Wildlife Management Area in the Grand River Authority took place. The Devil's Punch Bowl Conservation Area, located in the Hamilton Region Authority, was opened October 2, 1971. This conservation area provides a superb view of Stoney Creek, Hamilton, Saltfleet, and on clear days even Toronto.

Development and provision of additional facilities occurred in many conservation areas. One of the biggest projects was the construction of the dam and reservoir clearing at the Binbrook Conservation Area, a site of approximately 1,000 acres in the Niagara Conservation Authority. A 23 acre lake was constructed at the Warwick Conservation Area in the Sydenham Valley in 1971. A picnic area was cleared and plans were made for the location of a beach and parking facilities.

Buell's Creek in the Cataraqui Authority was developed and provisions were made for 24 campsites and bridle paths in the area. Similarly, the Metro Toronto and Region Authority made provisions for 150 trailer sites, each with their own water supply, sewer dumping facilities, electricity and conveniently located washrooms in the

Conservation areas provide numerous recreational facilities for the public—playgrounds (left), sailing (centre) and other water sports and fishing or nature study (opposite) are some examples.



Claireville Conservation Area.

A number of authorities conducted maple sugar demonstrations, which proved to be very popular. Over 41,723 people visited the maple sugar operation at Bruce's Mill in the Metro Toronto Authority. The Niagara Authority conducted a sugar bush operation on property leased from Vineland Quarries and Crushed Stone Ltd., which attracted an estimated 10,000 visitors. Other demonstrations were held at Rattlesnake Point in the Halton Authority and Albion Hills in the Metro Toronto Authority.

A number of new conservation areas with recreational potential were acquired during 1971. As lands, particularly in the near urban authorities, are becoming both increasingly scarce and more expensive, and as the demand for recreational facilities increases, additional conservation areas will have to be acquired annually.

This year, some notable acquisitions include Mono Cliffs, 245 acres of escarpment land in the Nottawasaga Authority, the Osprey Wetland Conservation Area, and Minesing

Swamp. A government dock and lighthouse, which were built circa 1790 and reconstructed from quarried stone in 1818, were acquired by the Lower Thames Conservation Authority.

Canoe and boat races were held on a number of rivers within authorities, including the Credit, Grand, and Humber. An overnight canoe trip planned by the authority was held in the Cataraqui Authority, and the Nottawasaga Authority held its 3rd Annual Conservation Canoe Race in

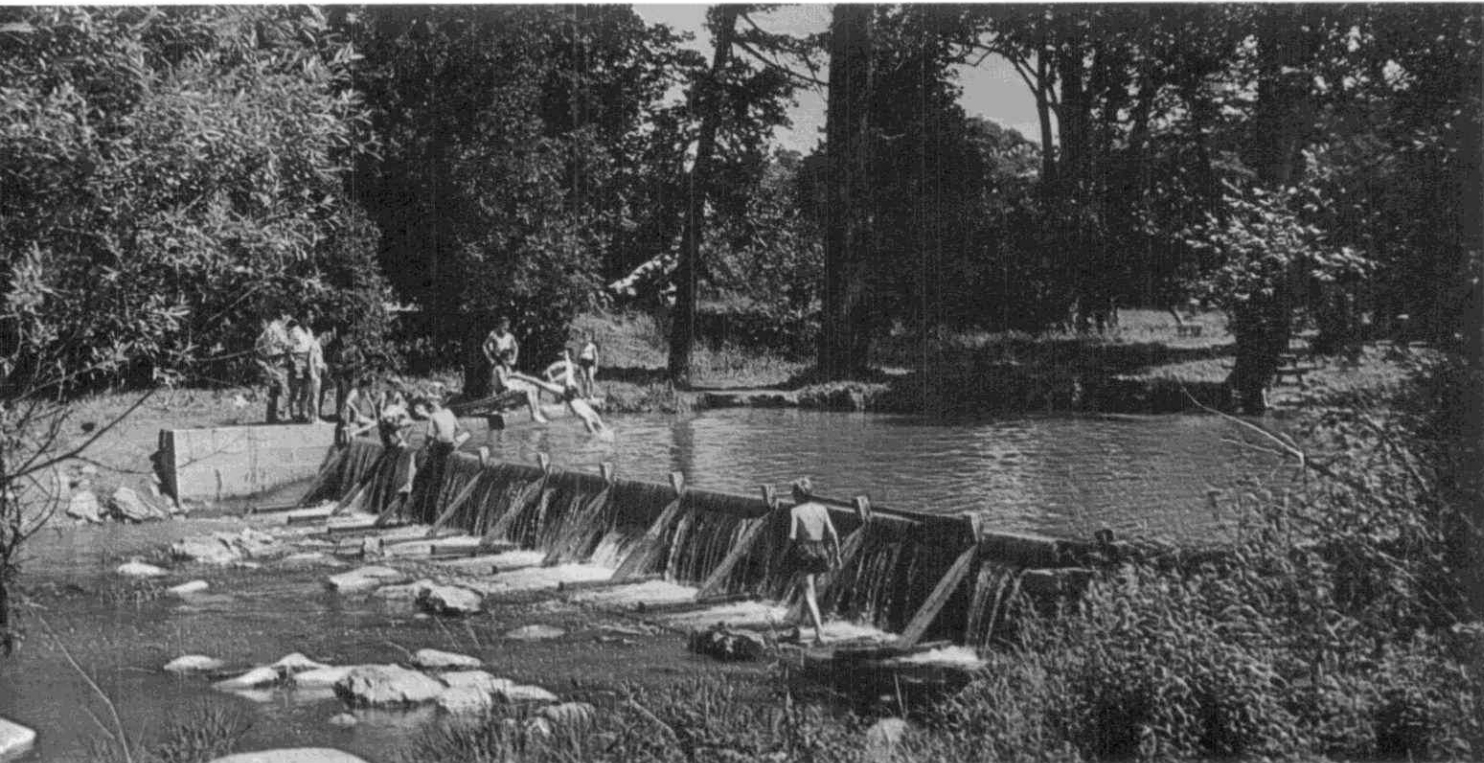
June. Over 45 canoes participated in this race from Angus to Wasaga Beach, a distance of 40 miles, for 9 trophies and cash awards of over \$400.

The Ausable River Conservation Authority celebrated its 25th anniversary on July 17th, 1971, and the Grand Authority designed its own flag. The flag has the blue, green and white emblem of the Grand Authority placed on an orange background, and it will be flown at all conservation areas within the authority. The Grand Authority also hosted the National Campers and Hikers Association Annual Convention at their Brant Conservation Area, which was constructed in two years especially for this event. Over 40,000 campers attended the convention.

The Recreation Section carried out field surveys in the South Lake Simcoe Conservation Authority and in the Ganaraska Conservation Authority during the summer, as part of the branch service to conservation authorities.



Winter camping is becoming more and more popular. Here a group of boy scouts enjoy the outdoors at a conservation area.



*Winter or summer—conservation
authorities make it possible to enjoy
all seasons.*



Water Management

Proper management of our water resources is an essential element in the protection and preservation of our total environment. Without an adequate supply of water of good quality all natural and human activity would cease to function.

In Ontario 37 conservation authorities are operating and fully aware of the importance and need of sound water management. All are engaged in various forms of control and improvement.

The major effort and expenditure continues to be concentrated on large and small reservoirs which include flood control and low flow augmentation as primary benefits, with additional benefits of improved ground water tables, water supply, fire protection, and recreational facilities.

River channel improvements are of primary concern in many areas. They include major realignment and, in some cases, channel linings to prevent erosion of banks, as well as a variety of minor erosion control measures resulting in protection of valuable property subject to damage during excessive run-off periods.

Mapping and regulation of flood plain lands and the consequent acquisition of these lands where necessary is a major activity in many authorities, and is an important aspect of the overall water management plan.

The Christie Dam, Hamilton Region Conservation Authority, is one of the larger water management projects undertaken by a conservation authority.

Planning and engineering studies are a continuing policy of the department in relation to the variety of water control problems and their ultimate solution. These studies permit adequate evaluation in terms of feasibility and possible alternatives, and lead to better cost-benefit assessments to achieve maximum benefits.

A significant fiscal policy change introduced during the year affected the provincial water supply reservoir program, which formerly provided grants of 75% for construction of small reservoirs.

This former policy was terminated December 31/71, and a new program of financing and cost sharing has been established as follows:

- A 50% grant for lands required for the project, plus the supplementary grant where applicable.
- A 50% grant towards the first \$30,000 of the cost for final engineering and construction, plus the supplementary grant where applicable.
- Full payment of all engineering and construction costs in excess of \$30,000.

Federal Provincial Agreements

Under these agreements, the Government of Canada and the Province of Ontario are equal partners, each contributing 37½% of the total cost of an approved project, with the remaining 25% being financed through the conservation authority concerned.

Only two agreements are in effect at present, with the Metropolitan Toronto and Region and the Upper Thames River Conservation Authorities.

Notable activity under the M.T.R.C.A. agreement is the approval for the construction of the High Finch Dam and Reservoir on the west branch of the Don River. This project will be under way as soon as weather permits in the spring of 1972.

The Bolton Dam and Reservoir on the Humber River is in the final engineering stage, which should be completed early next year.

The Glengowan and Thamesford reservoirs in the Upper Thames Valley Conservation Authority have not proceeded beyond the preliminary engineering stage at this date.

Land acquisition, coupled with flood plain mapping and land use regulation, is proceeding as a continuing policy in both authorities, and is a costly and time-consuming but very necessary procedure.

Small Reservoir Program

This program continues to expand to the extent that it accounts for approximately 50% of the total expenditure on water control projects for the fiscal year.

Most activity centres on new construction, but where practicable older existing structures are reconstructed or repaired to the point where they can serve a useful purpose in the overall water control program.

A total of 93 projects have been completed under this program since its inception in 1964.

During the 1971/72 fiscal year the following 8 dams were completed: Little Cataragui in the Cataragui Region, Scotch Block in the Halton Region, Christie Dam in the Hamilton Region, Maley Dam and Reservoir in the Junction Creek Region, Binbrook in the Niagara Region, Fort Creek in the Sault Ste. Marie Region, Warwick in the Sydenham Valley, and the first stage of the 3rd Depot Lake in the Napanee Region Conservation Authorities.

Reconstruction of the Scanlon Dam in the South Lake Simcoe Authority was also completed during the year.

Three dams and reservoirs were approved and construction started—Allan's Mill in the Crowe, Hilton Falls in the Halton Region, and Warkworth in the Lower Trent Conservation Authorities.

In addition, three projects are approved for construction which will likely commence during the 1972 summer season.

Four projects are in the final engineering stage, and 58 in various stages of preliminary studies. The majority of these studies have been completed and deferred for further consideration.

Channel Improvements

Second only to construction of dams and reservoirs in water control is improvement of river channels, the natural drainage system of the watershed.

Improvement may take the form of cleaning by removing excess sediment deposit or debris carried into the stream at times of excessive run-off, or in some extreme cases reconstruction of the channel by re-alignment, widening and deepening, to increase the carrying capacity.

In areas where bank material is unstable support walls must be constructed to prevent erosion and damage to valuable property.

During the year nine channel improvements were completed at Plantagenet Springs in the South Nation Valley, at New Hamburg and on Schneider Creek (Phase I) on the Grand River, Pennock Creek at the Lakehead, Delsey in the Hamilton Region, Running Creek on the Sydenham, and at Highland Creek and the Rouge River near the new zoo, in the M.T.R.C.A.

The Long Sault diversion in the Raisin River Authority was also completed. Two other diversion projects are in study stages, the Hager-Rambo diversion in the Halton Region is in the final engineering stage, and Bennett-West Davignon diversion in the Sault Ste. Marie Region is in the preliminary engineering stage.

Channels under construction at varying stages are: McVicar's Creek (Phase III) and the Neebing River in the Lakehead Region, the Mimico Creek at

Malton and the West Don at Bathurst Street in the M.T.R.C.A., at Madoc in the Moira Authority, at Collingwood in the Nottawasaga and in Brant Twp., Silver Creek at Walkerton, and at Durham in the Saugeen Valley Conservation Authority.

One project at the Town of Tilbury (Phase I) on the Lower Thames has been approved for construction and will commence shortly.

There are four projects in the final engineering stage, Phase II of the Town Creek in the Mattagami area, Joshua Creek, 14 Mile Creek, and at Milton on 16 Mile Creek (Oakville) in the Halton Region.

Twenty-two other channel improvement projects are being investigated and are in various stages of preliminary engineering study.

Complementary to channel improvement measures is the preventive system of erosion control which, if carried out at an early stage, could prevent costly construction improvements and damage to valuable property.

Five erosion control projects were completed during the year, at Grand Bend (Phase I) on the Ausable, at Brantford on the Grand, at Dodd's Creek in the Kettle Creek area, Dover Twp. on the Lower Thames, and at the Town of Napanee in the Napanee Region.

Three projects were under construction and will be completed in the coming year at Port Franks on the Ausable, at Hastings in the Otonabee Region, and at Springbank Park in the Upper Thames Valley.

Seven additional erosion control projects are being planned, and at present are in the preliminary engineering stage.

Flood Plains

The flood plain of a river is the land area bordering the river which is subject to inundation in periods of excessive run-off when the river overflows its normal channel.

In many cases this plain has been encroached upon with buildings and services subject to the hazard of periodic flooding.

Mapping of the flood plain makes it possible to regulate activity within the potential flood area to avert serious property damage and possible loss of life.

All authorities are aware of the advantages of mapping and planning the use of the flood plain, but most such activity is centred in the densely populated urban centres, for example the Metropolitan Toronto & Region, Upper and Lower Thames, Grand, Central Lake, and Niagara Region Conservation Authorities.

Other areas with mapping and plans for mapping are the Junction Creek, Lakehead, Nottawasaga, South Lake Simcoe, Mississippi, Rideau, and Saugeen Authorities.

Flood Warning

An extensive network for the collection of hydrometric and precipitation data has been developed by the Conservation Authorities Branch in conjunction with conservation authorities, and in co-operation with the Inland Waters Branch and the

Atmospheric Environment Service of the Canada Department of the Environment. These data are important for effective water management with regard to flood forecasting, dam and reservoir operation, engineering design, pollution abatement, recreation planning, and fish and wildlife management.

The major portion of the hydrometric network consists of continuous recording instruments, with an increasing number of attached telemetering instruments for distant reading facility.

The majority of rain and snow measuring equipment is of the manual type, plus 17 continuous recording rain and snow gauges, and 57 snow courses for snow cover and snow density observations.

The cost of operating and maintaining the stream gauging network is shared equally with the Water Survey of Canada, Canada Department of the Environment.

Maintenance and Operation of Water Control Structures

To adequately maintain all structures, regular inspections are carried out and grants of 75% of costs of maintenance and repairs are provided to conservation authorities.

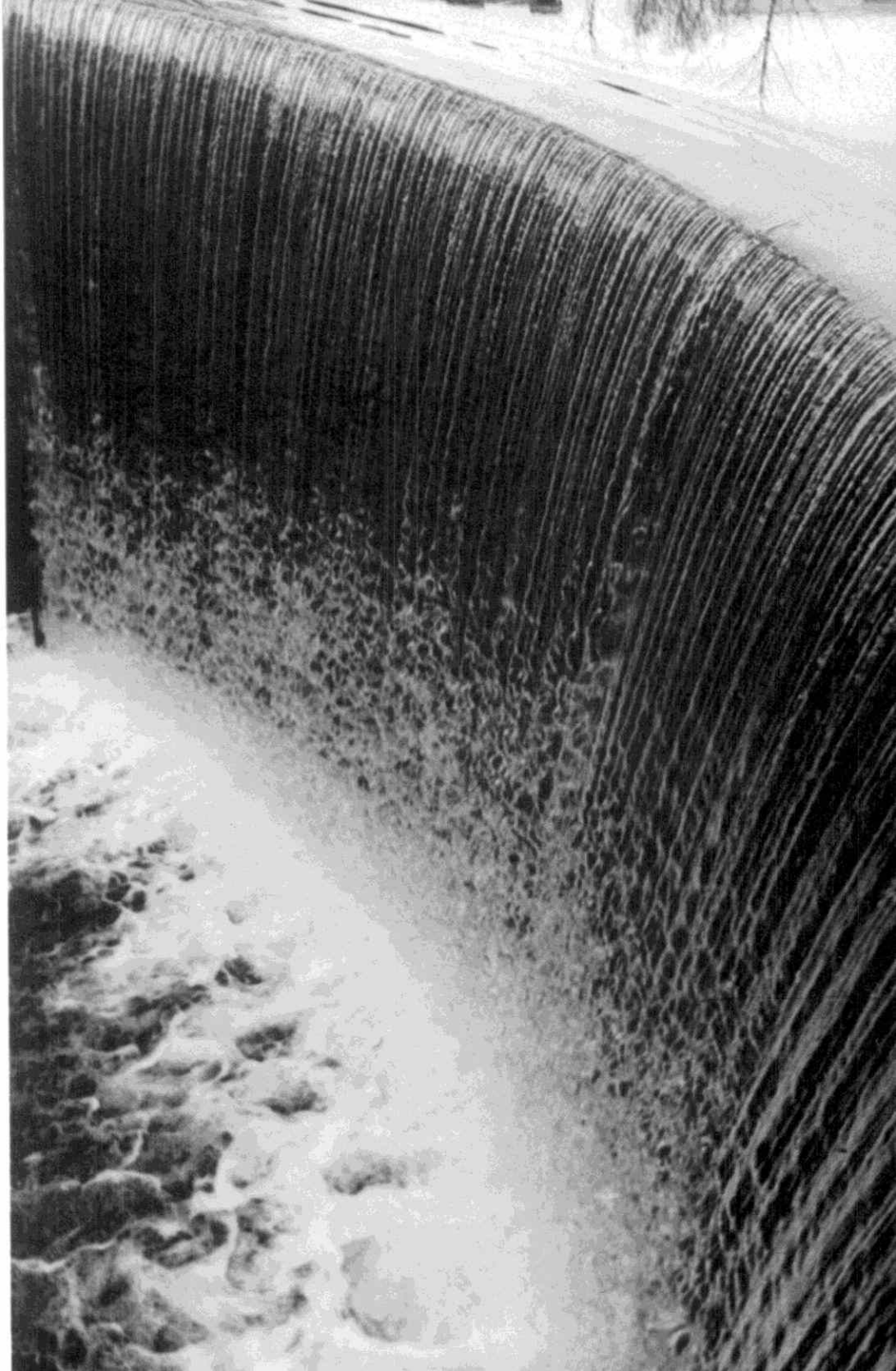
Detailed reports of inspections and necessary repairs are filed with the authorities, enabling them to proceed with the necessary work.

During the year a total of \$177,940 was paid to 30 authorities toward the cost of maintenance and operation of water control structures.



Above, a small dam under construction.

Man-made spillway constructed in the Grand River area controls water flow (right).



Pesticides Control Service

On December 1st, 1971 the Pesticides Control Service was transferred from Environmental Health Services Branch, Department of Health, to the Department of the Environment.

Head office for the Service is still located at 1 St. Clair Avenue West, Toronto, with regional offices in London, Hamilton, Belleville and North Bay. District offices are located in Chatham, Simcoe, Owen Sound, Ottawa, and Clinton. A regional office is also planned for Thunder Bay.

In 1971 the service was engaged in routine inspection and law enforcement operations. The disposal of DDT, left over from 1970, was co-ordinated with the Waste Management Branch, and chemicals were transported to selected disposal sites.

Regulations under the Pesticides Act were amended to improve fumigation of vehicles. The new amendment stipulates that a vehicle under fumigation cannot be moved without written permission from the director of the branch. This change was prompted by the increasing incidence of box cars arriving at mills in Ontario from points

outside the province while still under fumigation with methyl bromide. This constituted a considerable hazard to mill employees unloading the car and could present a hazard in transit.

A second amendment was introduced to restrict the use of thallium sulphate as a rodenticide. This amendment was the result of recommendations by the Pesticides Advisory Committee after it reviewed the use of thallium sulphate as a rodenticide.

Education and Technical Section

The Education and Technical Section has published four issues of News and Views. The mailing list was updated and present circulation is approximately 4,500 copies per issue. The mailing distribution is global, except for China.

Departmental exhibits were held at the Central Canada Exhibition (Ottawa), Western Fair (London), International Plowing Match (Nanticoke), and at the Royal Winter Fair (Toronto).

The distribution of pamphlets, brochures, and other educational material at the fairs declined approximately 33% following budget restriction for printing materials. Libraries, public and high schools, community colleges, Pollution Probe organizations and others have been advised that only limited amounts of copies are available. Total distribution of all pamphlets was approximately 200,000. In 1970 the distribution was in the range of 325,000.

Service-in-training courses for pest control operators (custom sprayers) were held at Toronto for two days, at Guelph University for one day, at London for one day, at the Agricultural College, Ridgetown for one day, and at Ottawa for one day.

A two-day training course was held in Toronto for structural pest control operators.

The total attendance for the combined courses was far in excess of 1,500. Approximately 1,395 copies of the proceedings from these service-in-training courses were distributed to those who specifically requested them.

The Department's Herbicides Correspondence Course has now been accepted as an adult retraining curriculum for full and part time students. The University of Toronto has accepted our insecticides course as an accredited general science course at grade 12 or 13 level.

The following high schools and community colleges have incorporated our courses into their curriculum: St. Clair College of Applied Arts & Technology, Windsor; West Park Vocational College, Toronto; Niagara College of Arts & Technology, St. Catharines and Welland; Algonquin College Technical Centre, Ottawa; and Correctional Service, Ontario Training Centre, Brampton.

Herbicides correspondence courses were conducted by the Department of Transport through their training headquarters in Toronto.

The total number of applicants for all courses for 1971 was 1,125. Of these, 1,012 students graduated and received certificates, and 113 failed.

Field Section

The field staff were engaged in follow-up and routine inspection work. Two serious accidents occurred during the year. Fire destroyed a warehouse in Chatham, causing damages in excess of \$100,000 of pesticides chemicals. The death of a six year old boy in North Bay was believed to be caused by careless application of the insecticide Lindane. Results of an inquest indicated that Lindane had not caused the death.

The Simcoe District Office issued all the permits for use of DDT on tobacco. In all, 4,001 permits for this use were issued. Arrangements were made with the Soil and Crop Branch of the Department of Agriculture and Food to issue permits for the use of DDT for the control of plant bugs on apples. The branch issued 225 permits.

There was a substantial decrease in the number of permits issued for hormone type herbicide for airborne application. The decrease was about 55% from 261 in 1970 to 145 in 1971. Forty three permits were issued for the use of group A substances for structural exterminations.

A total of 5,611 licences was issued during 1971, approximately 6% more than in 1970. Total custom enrollment for 1971 was 601 registrations. However, the number of pesticide vendors registered with the service again declined, by approximately 45% in 1971. The total number registered in 1971 was 369, a decrease from 592 in 1970. This may reflect the restriction of aldrin, dieldrin, heptachlor and DDT in Ontario since 1969.

Six summer students were employed in 1971. Two summer students were employed in Toronto and four in the Simcoe, London and Chatham areas, mainly to map tobacco fields.

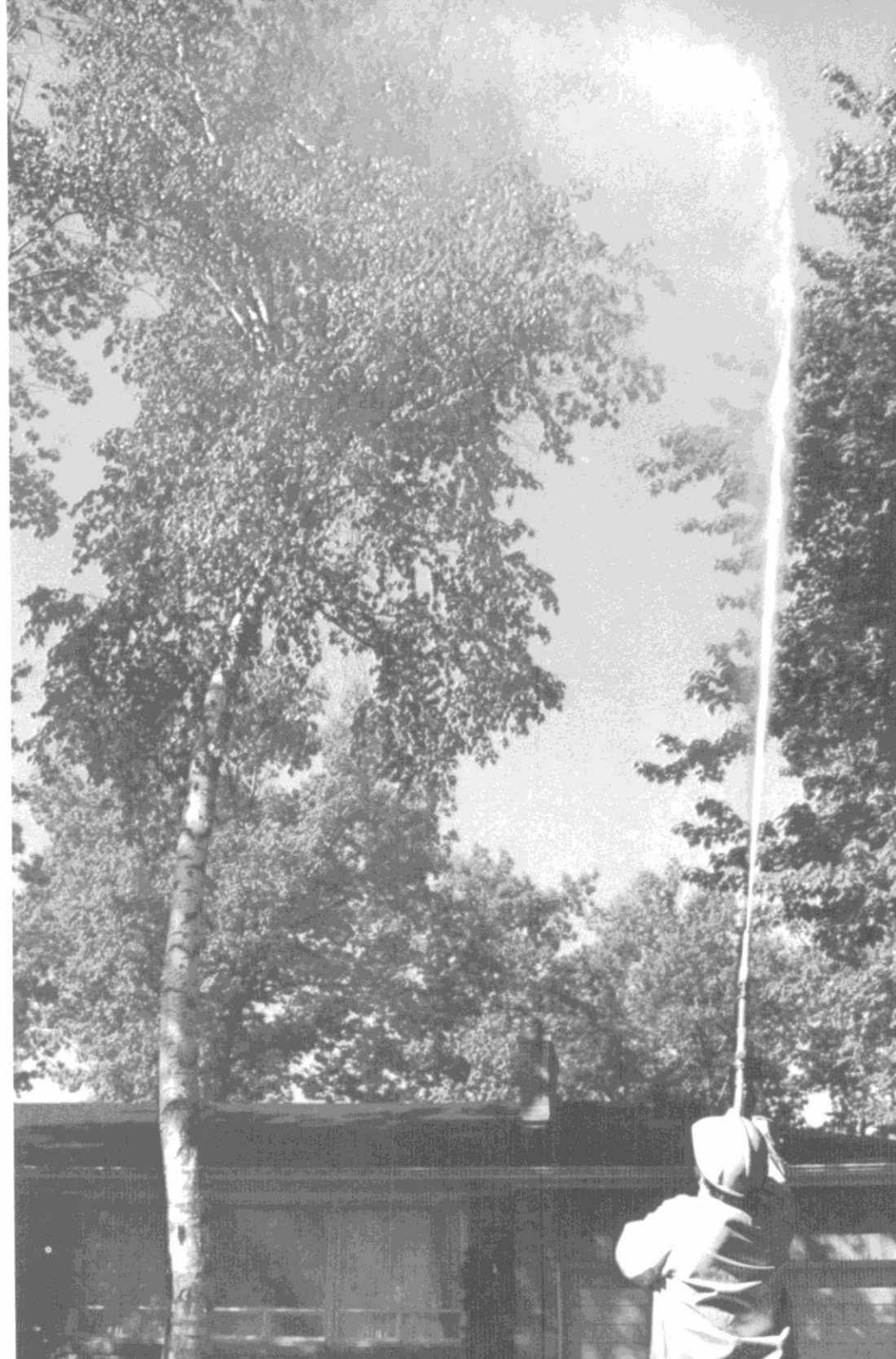
Pesticides Monitoring Programs

In co-operation with the Pesticides Residue Testing Laboratory of the Ministry of Agriculture and Food the service initiated a program to monitor air-borne pesticide contaminants. Two equipment units were designed for this purpose. The principle of operation of these units is to extract air-borne contaminants—particulate matter and volatile gases—from the ambient air.

When air is passed through the equipment particulate matter is precipitated on a filter, and the gases are extracted in an extraction solvent.

The monitoring program started in

Pesticide applications are closely supervised by Ontario Pesticides Control Service.



the latter part of April and ended in early September. Most insecticide sprayings were carried out during this period. Two locations were selected for this program, at Lynedoch and Kelvin in Norfolk County.

Norfolk County uses the greatest percentage of insecticides in this province. A total of 51 air samples was analyzed for chlorinated hydrocarbons, organophosphorus, and PCB's. Only sporadic samples contained a detectable level of chlorinated hydrocarbons, and approximately five samples showed a significant level of PCBs.

After evaluating the monitoring report, it was decided to discontinue the program at Norfolk County and relocate to another area. It was suggested to set-up a similar program in Ridgetown and the Holland Marsh for 1972. In 1971 some milk samples analyzed for pesticides residue showed progressive increases in PCB contamination. It was thought that this might have some relation to air quality. The Holland Marsh was chosen because of agricultural activities in that area.

In 1968 the department undertook a monitoring project to assess pesticide residues in water and soil, and in some meat for human consumption. Cornwall, Belleville, Newmarket, St. Catharines, Ingersoll, Chatham, Owen Sound, and North Bay were selected for sampling. Samples are collected quarterly by field staff and forwarded to the Pesticides Laboratory for analysis.

This project is a five-year program which should be completed in 1973.

An interim evaluation report shows a gradual decrease of pesticides residue in all commodities.

In addition to these two projects, the service submits samples of human milk and fat from time to time. In 1971, only six human milk samples were submitted for analysis. The average was (butter fat content) DDT 6.28 ppm, dieldrin 0.05 ppm.

In 1970, a total of 28 human milk samples were analyzed. The average was (butter fat) DDT 2.60 ppm, dieldrin 0.130 ppm. To compare these results would be difficult because of the decrease in the number of samples analyzed from the previous year. It will probably be more meaningful when they are assessed with a total program objective.

Some 111 samples of human fat were submitted by various hospitals for pesticides residues. The results (extractable fat) were: DDT 6.59 ppm, dieldrin 0.16 ppm and PCBs 1.6 ppm.

In 1970, only 35 samples were submitted and analyzed for residue. The results were: DDT 9.22 ppm, dieldrin 0.216 ppm. Again, this would be rather difficult to assess in percentages because of the increase of samples analyzed, except that PCBs showed up significantly in 1971. In other chlorinated hydrocarbons analyses show a declining level.





Licensing, Examinations and Prosecutions

This position was created in 1970, when examinations and prosecutions were returned to the department from the Advisory Board for administrative purposes. The position was filled in the latter part of 1971.

Fourteen charges have been laid for violations of the Pesticides Act and Regulations. Ten convictions and one dismissal resulted, and three cases are pending.

Examinations

The Examination Committee processed 884 applicants for operator's and extermination licenses, 823 for land and 61 for structural exterminations, an increase of 5% from 1970.

The Examination Committee met early in the year to revise and upgrade the standard for examinations. This standard is now strictly adhered to at all examinations.

Absenteeism of applicants from examination was a serious problem in the past. This was considerably reduced when a fee of \$5.00 for each examination was introduced. An applicant would forfeit his deposit if he did not appear for examination. This measure reduced absenteeism by approximately 80-85%.

Total revenue from examination from January 1, 1971 to January 1, 1972 was \$4,420.

Airborne spray applications are closely supervised by the Pesticides Control Service to forestall damage to the environment.

Private Waste and Water Management Branch

The Public Health Engineering Service was transferred to the Department of The Environment on December 1st, 1971 and renamed Private Waste and Water Management Branch. The staff transferred on that date included 85 full time positions.

With the exception of public swimming pools and summer camps, all the responsibilities of the former Public Health Engineering Service were transferred. These included advising on the engineering aspects of septic tanks and other private systems.

The primary reason for the transfer was the enactment of The Environmental Protection Act in August 1971. The Act, in Part VII, made the Department of The Environment responsible for approving all sewage systems that were not already controlled under The Water Resources Act. Part VII comes into effect in an area only when that area is designated by proclamation of the Lieutenant Governor in Council to be an area to which Part VII applies. No areas had been so proclaimed up to the end of 1971.

The ultimate objective of the branch is the elimination of all irreversible damage to the natural environment, in particular to the water system of

Ontario, resulting from liquid and solid sewage effluents other than industrial and agricultural wastes released or removed from sewage systems in unsewered areas.

The Regional Operations Section provided an advisory and assistance service in the field to local health units and to the public throughout Ontario on matters pertaining to private water supply and sewage disposal through regional offices in London, Hamilton, Toronto, Kingston, North Bay, and Thunder Bay, and through district offices in Bracebridge, Peterborough, and Ottawa. In addition, there are a number of other locations in the province where staff was available to meet local needs and demands.

Until Part VII of The Environmental Protection Act comes into effect the medical officer of health will continue to handle the bulk of complaints concerning faulty sewage disposal or practices received from the public. However, the branch provides assistance to the health units, and in that capacity handled many of these complaints referred to it for investigation and resolution. In addition, many complaints requiring

investigation were received directly from the public or other agencies.

In 1971, 85 Official Plans and 30 Zoning By-laws were reviewed to ensure that such plans had, where necessary, recognized and included provision for private sewage and water needs.

A major effort involved the appraisal of unserved land where new lots were proposed by subdivision of or severance from an existing lot. The primary objective of these appraisals was to establish whether or not such a lot could be supplied with water and was capable of receiving and disposing of sewage from the establishment by means of a subsurface disposal field on the site, or by a suitable alternative method.

A reliable estimate of the number of new unserved lots proposed for subdivision or severance throughout the province has only recently become available. In 1971, 46,500 such lots were proposed. Of these, 16,500 (28%) were appraised by this branch, but staff were not available to inspect all of the

Boring to groundwater level makes it possible to test for seepage from sewers.





lots. Some of the remainder were inspected by local health agencies.

In some districts, particularly in the recreational cottage areas where the local health agencies have been hard pressed to cope with the heavy demand placed upon them by the public, it was found necessary to provide additional provincial staff for reinforcement. Particularly in the Muskoka-Parry Sound Health Unit area this branch provided sufficient assistance to enable combined staffs to handle all requests for land subdivision and severance appraisals, and all septic tank permits for new construction.

During 1971 the Technical Services Section provided technical support through regional operations staff to local health units, to other agencies, and to the public regarding private water supplies and sewage systems.

Studies were carried out to develop techniques for tracing effluent discharged from subsurface sewage disposal systems. Tracers in the form of chemical dyes and radio-isotopes were used in 47 establishments requiring special study on 9 recreational lakes to determine whether or not these sewage systems were polluting the groundwater during the test period.

A total of 10,000 samples were taken for these studies. Of these, 4,000 were for detection of radioisotopes and dye tracers, 2,000 for chemical analysis

Outhouses built over waterways are one of many faulty sewage disposal practices investigated by Private Waste and Water Management.

(phosphate, nitrate and ABS), and 4,000 for bacteriological analysis for total and fecal coliforms. The interpretation of the results of the analyses is in progress.

During the year studies were continued at Whitby into the treatment of septic tank effluent by passing it through sands of different physical characteristics in underdrained tile beds. With one of the sands an additive (consisting of 4% by weight of oxides of calcium, aluminum, iron, silica and sodium) was tested for its effect on removal of phosphates. After one year's operation results indicate that significant reductions of phosphate content in the waste are achieved.

Investigations were carried out also to determine the flow patterns of waste through horizontally placed perforated plastic pipes used for distribution in seepage beds. This work is designed to assist in developing criteria to be used in the regulations for diameter of pipes, location and size of holes, and other factors to ensure uniform distribution of the effluent.

In the Soils Laboratory 370 soil samples, received mostly from the regional operations staff along with some from local health units, were

analyzed for particle size distribution and permeability coefficient to determine the suitability of the soil for installation of septic tank seepage beds.

Late in the year preliminary investigations were made into the feasibility of conducting test programs, possibly through private agencies, to evaluate the applicability of aerobic sewage treatment plants as an alternative method in rural areas of the province.

The need for feasibility studies and demonstration projects on sewage holding tanks was established, but funds were not available for this in 1971.

In 1971, the Cottage Pollution Control Section inspected cottages located on lakes in the District Municipality of Muskoka, the Trent Waterways System, the Rideau Valley Watershed, and the Cataraqui Region. A total of 5,839 waste disposal systems were reported upon. Only 2.7% of the cottages were found to be directly polluting. However, an additional 27.8% were unsatisfactory. By far the most common defect was improper disposal of wash water and kitchen wastes.

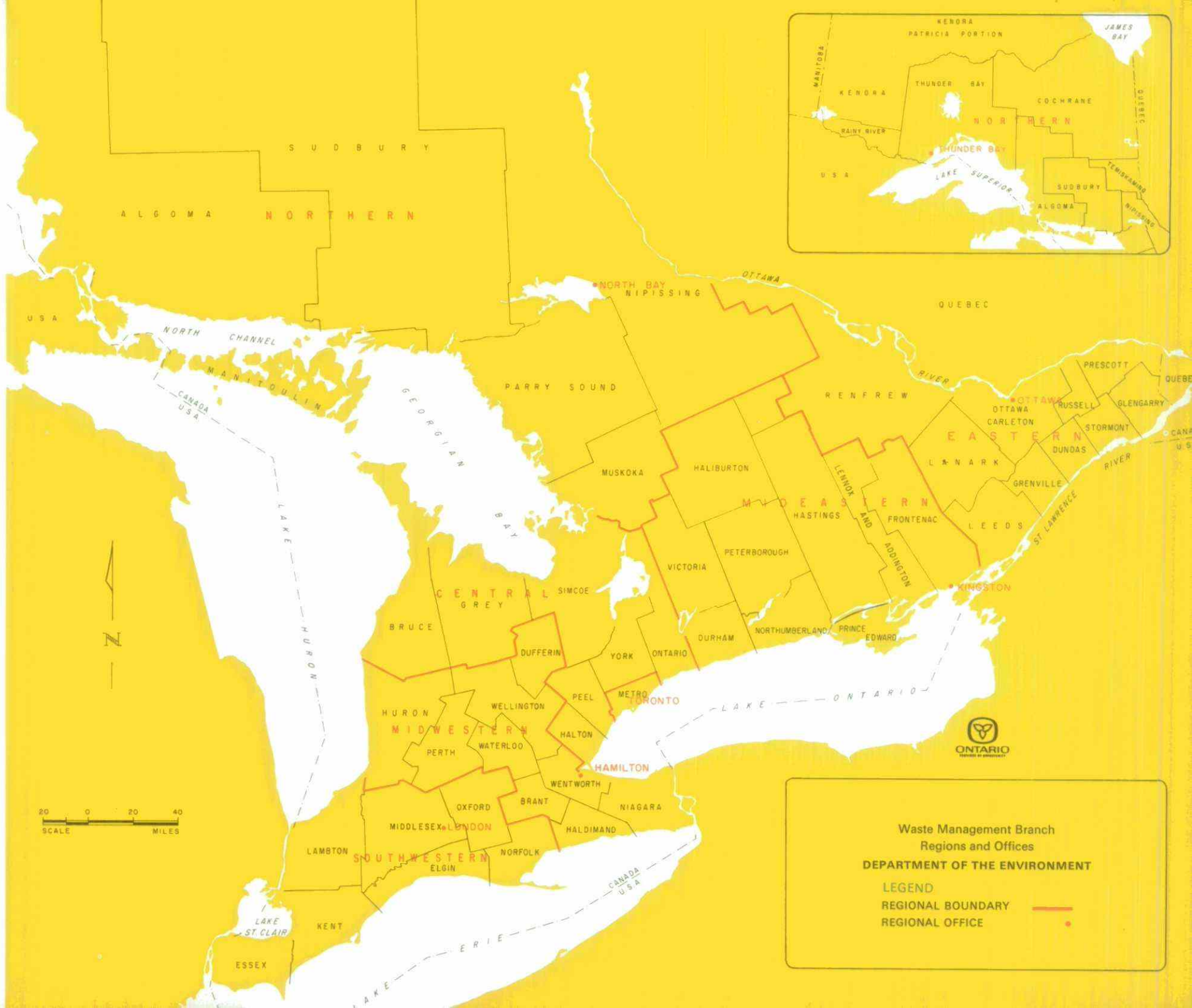
Five abatement technicians made 1,659 visits to establishments on 17 lakes. An additional 105 site visits on 9 lakes were carried out by the Northern Ontario Public Health Service working in conjunction with abatement personnel of this branch. A total of 718 premises were inspected, 308 agreements were signed, and work was completed on 220 premises. The

majority of those who have signed an agreement and have not yet completed the work (88) indicate that the work will be completed in early 1972.

The tracer program on 47 selected cottage sites mentioned above was carried out by detection survey aides in co-operation with the Technical Services Section. This involved drilling of holes well below the water-table between the cottage disposal system and the lake, and taking of samples to determine whether the disposal systems were operating satisfactorily. Chemical dyes and radioactive tracers were used. Further tracer work will be done in 1972 based on techniques developed in 1971.

Drainage pipe running from a cottage directly into a waterway is a common source of water pollution.





Waste Management Branch

The conclusion of this year represents the end of the beginning of the waste management program in Ontario. It has seen the incorporation of The Waste Management Act into The Environmental Protection Act, as well as the extension of supervision and certification to all types of waste disposal sites throughout the province.

With increasing responsibilities for the many aspects of waste management the depth of penetration into many areas has been thin, but the establishment of additional regional offices and a substantial increase in staff has resulted in an increased level of service. Regional Waste Management offices are now located in London, Hamilton, Toronto, Kingston, Ottawa, and North Bay, with a sub-office at Thunder Bay.

The licensing program has continued to develop and by the end of March 1972 907 waste disposal sites had been registered with the branch. These sites, comprised in part of 643 landfill and 221 dump sites, were at various stages of acceptability varying from full compliance with The Environmental Protection Act to conditions warranting closure and relocation. At the end of the fiscal year 631 waste management

systems were registered, including 387 private systems and haulers.

Under the provision of The Waste Management Act and The Environmental Protection Act 12 actions were initiated by the Waste Management Branch for prosecution and Director's Notices. Hearings of the Pollution Control Appeal Board were held in 3 cases, and one prosecution resulted in a conviction. In the hearings before the Pollution Control Appeal Board expert witnesses were provided by members of the branch.

The primary role of the branch has been implementation of responsibilities for the inspection and certification of waste disposal sites and waste management systems under The Environmental Protection Act. However, the branch has also been very active in certain more specialized aspects of waste management. These include

- disposal of liquid industrial waste
- disposal of pesticide residues
- investigation of the abandoned automobile problem
- investigations of littering and disposable packaging
- investigation of the problem presented by disposal of liquid wastes into deep wells
- the disposal of snow from city streets
- the disposal of tissue and other special wastes from hospitals
- problems associated with the disposal of sewage sludges from treatment plants
- investigation of the potential of rail haul for transportation of urban refuse
- investigation of the social, economic and technical aspects of recycling of useful materials from refuse.

As a result of the failure of a number of individual efforts to establish a facility in the Toronto-centered region to effectively process and stabilize liquid industrial wastes produced by industry, the government has intervened directly. Under the auspices of the branch, an acceptable site was located in the Town of Mississauga. The land has been purchased by the government, and a ten-acre site has been leased to Goodfellow Combustion Ltd. for a period of twenty years.

This subsidiary of Canadian Industries Ltd. will design, develop and operate a comprehensive facility to treat the liquid wastes of industry by means of thermal and chemical stabilization. Phase I, which is to provide incineration including neutralization of gaseous effluent, is designed to come into operation before the end of 1972.

Phase II, which will provide for the neutralization of acids and alkalis followed by separation of solids, is scheduled for completion during 1974. With this example of government leadership, it is anticipated that several additional facilities entirely under private auspices will emerge in the near future.

The blight of abandoned automobiles

causes much public concern. These hulks, distributed along the highways and adjacent areas, are unsightly and represent a significant resource.

A report has been completed by a joint interdepartmental committee about this problem, and it is recognized



The manufacture of fertilizer is one way to recycle waste from sewage plants.

that The Environmental Protection Act is appropriate legislation to develop a program. Plans are under way to bring the recommendations of the report to fruition, and it is anticipated that private industry will play a significant role, with government largely restricted to auxiliary measures.

An extensive study has been completed by a joint government/industry body established as the Littering Control Council of Ontario. The report of the Council has been widely distributed and, while too many viewpoints were presented to permit development of agreed recommendations, it presents a useful view of various alternatives. Substantial measures are planned to mount a comprehensive anti-littering program, and it is hoped that this will generate significant results.

Along with work to improve treatment facilities for liquid industrial wastes, a program to control subsurface disposal of liquid industrial wastes by means of deep wells has been announced. It is recognized that the capacity for safe subsurface disposal of these materials is limited, and that it should be reserved for wastes which cannot be adequately or economically treated on the surface. A program is being developed which will reflect this philosophy.

The problems and opportunities presented by salvage and recycling of useful fractions of refuse are receiving increasing public attention. Only two methods exist to curtail the rapidly rising curve of waste: restriction of waste generation at the source, or salvage and recycling of waste materials.

The problems of salvage and recycling are broad and complex, and have considerable socio-economic implications. It is also quite evident that certain natural resources appear to be approaching exhaustion of known supplies in the foreseeable future.

Moreover, it is apparent that the constantly increasing demand for energy may focus attention upon the need for salvaging the considerable energy present in the combustible fraction of refuse.

These situations pose questions of considerable magnitude and, although the branch has made a beginning in grappling with the problems, it is apparent that a greatly augmented study is required.

The disposal of pesticide residues

and of contaminated containers remains a matter for concern. A number of suitable disposal sites have been approved for this use, but improved methods of disposal are being examined by a committee set up for this purpose.

During the year advice was provided by the branch to individuals, industries, and government agencies on methods of treatment and disposal of a variety of clinical wastes. In addition, the branch is represented on the task forces which continue to deal with accidental spills of contaminating material. The branch was also represented on the special task force set up by the Minister to examine the problems of snow disposal.

An interagency task force was set up by the branch to examine the problems involved in the disposal of tissue and other special wastes from hospitals and institutions in the Metropolitan Toronto area. It is anticipated that the conclusions and recommendations of this task force may lead to improvements in the handling and disposal of such wastes throughout Ontario.

A major research project on sanitary landfill funded by the branch entered its third and final year. It is anticipated that the results of this study will be of significance to the development of future landfill sites.

A project to develop information on the feasibility of home separation of domestic wastes was carried out in Burlington, with the co-operation of the municipality and citizens groups. This study, and others arising from it, will be

of the utmost importance in the development of municipal reclamation plants in the future.

A 50% grant was provided to the County of Wentworth and the City of Hamilton for a comprehensive area planning study of waste management activities. Such studies are an essential prerequisite to the development of improved practices at acceptable cost.

Moreover, only by reducing the number of individual operations and collecting large quantities of waste at one treatment site can the benefits and economies of scale be realized which will permit implementation of newer methods of treatment, particularly reclamation.

Research into the properties of ground garbage was initiated. Results from this and future research will be applied to relax standards for landfilling with ground garbage. It is anticipated that this will encourage use of this treatment method.

The investigation of rail haul to reduce transportation costs was encouraged by the branch. If found practicable, this may have important consequences, as one of the major problems in the development of reclamation systems is the cost of transportation, in this case that of reclaimed material.

Abandoned cars are a frequent eyesore in rural Ontario. The Waste Management Branch promotes collection in central depots and recycling.



Information Services

Two significant changes occurred during this fiscal year and these reflected substantially on the work of the Information Services Section. The first was the passing of The Environmental Protection Act and the change of name from Department of Energy and Resources Management to Department of the Environment. The second was the complete reorganization of the Department of the Environment and the Ontario Water Resources Commission into the new Ministry of the Environment.

Although this reorganization did not officially become effective until April 1, 1972, the integration of the two information services programs began in March and was functioning well before the fiscal year ended. The reorganization resulted in all staff except two forming the new Information Services Branch of the Ministry of the Environment. The manager of Information Services and the librarian moved with the Conservation Authorities Branch into the new Ministry of Natural Resources.

Transfer of staff, equipment and files was carried out without loss of service to either the operating branches or the public.

The 1971-72 fiscal year was most productive for the Information Services Section with the improvement of several existing public information and education programs and the introduction of a number of new ones.

The most significant expansion occurred in the education program as increasing emphasis was placed on working with teachers, boards of education, and student groups.

The Straight Goods youth conference was born and the first annual session held at Laurentian University in Sudbury with more than 400 students from all parts of the province in attendance. The students' resources kit package was also refined, broadened and placed in all schools above the elementary level, as well as in all major public libraries in Ontario.

Workshop programs were continued for teachers and expanded beyond Metro Toronto into London, North Bay, and Timmins. Three experimental workshops for women active in local community organizations were held in London, Kingston, and North Bay as part of a developing adult information program.

A new departmental presence in the community was developed through the use of displays and exhibits at major shows around the province. A new exhibit was constructed and shown at the Central Canada Exhibition in Ottawa, the Canadian Lakehead Exhibition in Thunder Bay, and the Western Fair in London. The department also exhibited at the Canadian National Exhibition, the Peterborough Industrial Exhibition, the

International Plowing Match, and at a number of smaller fairs.

In co-operation with Ontario's weekly newspapers, a regular column on the environment was prepared by a former Toronto Telegram reporter and was being run on the "syndicated" basis to any weekly which cared to use it at no charge.

During the 1971-72 fiscal year, the Manager of Information Services made 21 visits to Air Management Branch field offices, 21 visits to conservation authorities and six visits to Waste Management Branch offices to assist in local public information and education programs.

The manager also attended 125 meetings and conferences in connection with departmental programs, projects and activities. On behalf of the department, the manager

accepted invitations to 13 speaking engagements throughout the province.

An additional 40 speaking engagements were accepted by other Information Services staff.

Staff also processed more than 4,000 requests for information received by letter or telephone.

A total of 25 news releases were prepared and distributed, and more than 250,000 copies of brochures and other printed matter were circulated to the public.

The editorial section of Information Services produced approximately 335,000 copies of various publications. These included 36,000 copies of several new titles of the continued series of Student Papers, a series of resource papers on pollution problems for high school and university students; 6,500 copies of several staff and other directories; 37,000 copies of Acts and Regulations; 211,000 copies of special publications, including a Guide to Conservation Areas; and 45,000 copies of miscellaneous publications.

The photography section enlarged the existing file of environmental still photographs by 7,700 exposures, taken largely in color for various branches of the Department of the Environment.

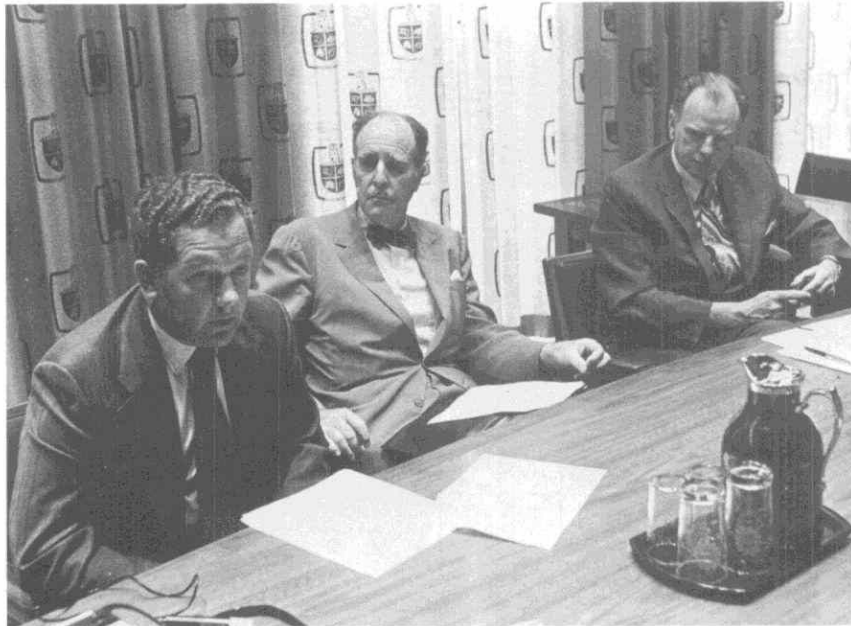
Exhibits depicting the various services performed by the branches of the department were set up at major fairs throughout the province.

conservation





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Information Services activities encompassed such diverse projects as The Straight Goods, Ontario's first youth conference on the environment (1, 3, 5), arranging a press conference on the Burlington Waste Recycling project (2), various displays including this one on auto pollution (4), and an outdoor display at the Canadian National Exhibition.

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Administrative Services Branch

The Administrative Services Branch provided both financial and administrative services to the department. These included all accounting and budgetary control services, as well as a centralized purchasing system. The branch also administered the Pollution Abatement Incentive Act, under which 628 grants totalling almost \$2 million were paid.

Accounting and Budgetary Control

A modern accounting system and prompt financial reports enabled management to control the annual expenditure of \$39 million. The responsibilities of this section included the formal submission of the annual estimates to the Management Board, as well as the centralized payroll system for some 500 persons.

Audit

Routine field audits on the books of conservation authorities were made in conjunction with some \$14 million grants paid to the authorities. This section also provided financial advice to authority staff, and the Conservation Authorities Branch.

Office Services

The Office Services Section operated the typing pool which provided typing and stenographic services to all branches, as well as the Central Records and Central Mailing Services. The use of a Central Purchasing Section ensured that lowest possible prices were paid for all departmental purchases.

Personnel Branch

The 1971/72 recruitment program provided 74 new staff members for permanent positions. In addition, a number of career-minded students were given the opportunity to become acquainted with department programs and gain experience.

Position administration involved identifying positions, preparing position specifications and organization charts, evaluating positions and ensuring the proper classification of positions.

The staff development program included departmental training courses, as well as nominating staff to attend the Department of Civil Service training courses and courses provided by outside agencies. A number of requests were approved for staff members to receive financial assistance for educational purposes.

The branch investigated problems involving personnel, counselled employees, and provided advice and

assistance to supervisors and senior management. The branch acted as liaison with the Department of Civil Service, Staff Relations Branch, Treasury Board and the Civil Service Association of Ontario in personnel matters.

Personnel records were maintained for all staff members, and the branch processed a variety of personnel transactions.

NUMBER OF EMPLOYEES BY BRANCH

	COMPLE- MENT MAR. 31 1972	STAFF MAR. 31, 1972
Main Office	20	19
Information Services	8	7
Personnel Branch	6	6
Administrative Services Branch	48	46
Air Management Branch	235	227
Conservation Authorities Branch	63	59
Private Waste & Water Management Branch	65	56
Waste Management Branch	20	19
Pesticides Control Service	21	20
Total	486	459

Tables

Air Management Branch

Abatement

A1 ABATEMENT ACTIVITIES—SUMMARY APRIL 1, 1971—MARCH 31, 1972

Number of Complaints Investigated	8,761
Observations	22,009
Inspections and Visits	30,331
Source Surveys	15,554
Section 83's Issued	28
Minister's Orders—A.P.I.	22
Advisory Board Hearings Requested	4
Number of Violation Notices	488
Number of Prosecutions	42
Number of Convictions	28
Number of Prosecutions Dismissed	8
Number of Prosecutions Withdrawn	6
Amount of Fines	\$14,025
Miles Travelled by Engineers	256,045
Miles Travelled by Inspectors	523,435
(Privately owned motor vehicles)	
Miles Travelled by Inspectors	129,914
(Government owned motor vehicles)	
Speaking Engagements	77

Approvals and Criteria

A2 GRANTS UNDER THE POLLUTION ABATEMENT INCENTIVE ACT, 1970

	AMOUNT	NO. OF CLAIMS
Claims Fully Met	\$709,710	288
Claims Partly Met	312,098	54
Claims Partly Rejected	182,500	29
Claims Totally Rejected	13,787	4
Claims not yet Assessed	134,660	
Claims Made	\$1,352,755	375

A financial statement is available only on the first twelve months of operation (1971 calendar year).

Phytotoxicology

A7 INCREASE IN PHYTOXICOLOGY COMPLAINT AND SURVEILLANCE INVESTIGATIONS—APRIL 1, 1969 TO MARCH 31, 1972.

Year	Number of Samples Taken		TOTAL
	Vegetation Complaints	Surveillance Visits	
1969-70	342	1714	2056
1970-71	1330	3329	4659
1971-72	1803	4493	6296

Year	Number of		TOTAL
	Complaints	Surveillance Stations	
1969-70	76	310	386
1970-71	121	626	747
1971-72	131	918	1049

Laboratory Services

A6 SUMMARY OF VEGETATION AND SOIL SAMPLE ANALYSES Summary of Vegetation and Soil Samples Analyses.

ELEMENT	NO. OF DETERMINATIONS	ELEMENT	NO. OF DETERMINATIONS
Sodium	200	Fluoride	3400
Potassium	130	Total Sulphur	2650
Calcium	450	Sulphate Sulphur	2110
Magnesium	70	Boron	160
Aluminum	300	Phosphorus	520
Arsenic	820	Chloride	2470
Vanadium	760	Silicon	40
Chromium	90	Cyanide	30
Manganese	20	Ammonia	150
Iron	1560		
Cobalt	1390		
Nickel	1460		
Copper	1500		
Zinc	2200		
Cadmium	1470		
Lead	940		
Total Metal Analyses	13,360	Total Non-metal Analyses	11,530

A3 APPROVAL APPLICATIONS 1971/72 2739 1970/71 2970

BROUGHT FWD FROM PREVIOUS YEAR	RECEIVED	APPROVED	CANC'D	DENIED	IN PROCESS
1971/72—337	2739	2625	155	41	255
1970/71—309	2970	2731	153	58	337

A4 STATIONARY SOURCES

	COMBUSTION SOURCES			INDUSTRIAL PROCESS			TOTAL
	HEATING	INCINERATOR	ODOR	PARTICULATE	CHEMICAL	STACK CHANGE	
1971-1972	5031	100	774	612	273	30	6823
1970-1971	3793	128	726	484	117	56	5204

A5 HEATING AND STEAM SOURCES BY FUEL

	COAL	OIL	GAS	TOTAL	TOTAL BTU. MM/HR
1971-1972	1	416	4614	5031	38,605
1970-1971	19	275	3499	3793	38,607

CONSERVATION AUTHORITY	ESTABLISHED	ENLARGED	SQ. MILES
Ausable/Bayfield	July 30, 1946	Jan. 1, 1972	931
Cataraqui Region	Dec. 17, 1964		1,286
Catfish Creek	Feb. 23, 1950	Mar. 29, 1961	189
Central Lake Ontario	July 17, 1958		242
Credit Valley	May 13, 1954	Feb. 17, 1955	383
Crowe Valley	Nov. 6, 1958		775
Ganaraska Region	Oct. 8, 1946	{ Mar. 15, 1962 Jan. 1, 1971	361
Grand River	April 6, 1966	Nov. 28, 1968	2,627
Halton Region	Dec. 30, 1963		366
Hamilton Region	May 8, 1958	{ June 1, 1966 Mar. 16, 1967	185
Junction Creek	Dec. 12, 1957		152
Kettle Creek	April 1, 1965		199
Lakehead Region	July 15, 1954	Jan. 1, 1963	980
Long Point Region	Jan. 1, 1971		1,074
Lower Thames Valley	Feb. 2, 1961	Sept. 19, 1968	914
Lower Trent Region	May 16, 1968		795
Maitland Valley	Sept. 6, 1951	Nov. 16, 1961	984
Mattagami Valley	Nov. 30, 1961		34
Metro Toronto & Region	Feb. 1, 1957		968
Mississippi Valley	May 2, 1968		1,718
Moirs River	July 31, 1947		1,056
Napanee Region	Nov. 20, 1947	July 8, 1965	750
Niagara Peninsula	April 30, 1959		936
North Grey Region	June 5, 1957		655
Nottawasaga Valley	May 5, 1960		1,210
Otonabee Region	July 9, 1959	{ Mar. 24, 1960 Mar. 29, 1961 Mar. 13, 1969	714
Prince Edward Region	Dec. 9, 1965		390
Raisin Region	Oct. 10, 1963	Feb. 29, 1968	525
Rideau Valley	Mar. 31, 1966		1,581
Sauble Valley	July 17, 1958	{ Sept. 3, 1959 May 27, 1954	560
Saugeen Valley	Mar. 16, 1950	{ Nov. 18, 1971	1,619
Sault Ste. Marie Region	Nov. 21, 1963		83
South Lake Simcoe	Jan. 1, 1971		535
South Nation River	May 8, 1947		1,512
Sydenham Valley	Jan. 12, 1961		1,052
Upper Thames River	Sept. 18, 1947		1,325
Whitson Valley	Sept. 3, 1959		123

Conservation
Authorities
Branch

C2

CONSERVATION AREAS EXPENDITURES 1971/72

Provincial Grant 50%

CONSERVATION AUTHORITY	CONSERVATION AREA	LAND ACQUISITION			DEVELOPMENT			TOTALS		
		AUTHORITY	PROVINCE	TOTALS	AUTHORITY	PROVINCE	TOTALS	AUTHORITY	PROVINCE	TOTALS
Ausable/Bayfield	Parkhill				10,818.72	10,818.70	21,637.42	10,818.72	10,818.70	21,637.42
	Sundry Areas				3,208.41	3,208.41	6,416.82	3,208.41	3,208.41	6,416.82
Cataragui	Buells Creek				13,433.73	13,433.72	26,867.45	13,433.73	13,433.72	26,867.45
Region	Charleston Lake				1,640.48	1,640.47	3,280.95	1,640.48	1,640.47	3,280.95
	Gould Lake				2,381.17	2,381.18	4,762.35	2,381.17	2,381.18	4,762.35
	LeMoine Point				228.80	228.80	457.60	228.80	228.80	457.60
	Little Cataragui Creek	3,797.09	3,797.08	7,594.17	1,273.29	1,273.30	2,546.59	5,070.38	5,070.38	10,140.76
	Seeleys Bay				4,342.81	4,342.82	8,685.63	4,342.81	4,342.82	8,685.63
	Sundry Areas				803.66	803.65	1,607.31	803.66	803.65	1,607.31
Catfish Creek	Conservation Services				554.00	554.00	1,108.00	554.00	554.00	1,108.00
	Springwater				18,608.64	18,608.62	37,217.26	18,608.64	18,608.62	37,217.26
Central Lake Ontario	Cranberry Marsh	47,669.24	47,669.23	95,338.47				47,669.24	47,669.23	95,338.47
	Enniskillen				1,063.70	1,063.70	2,127.40	1,063.70	1,063.70	2,127.40
	Harmony Valley				4,725.15	4,725.12	9,450.27	4,725.15	4,725.12	9,450.27
	Heber Down	41,061.63	41,061.59	82,123.22	3,729.89	3,729.88	7,459.77	44,791.52	44,791.47	89,582.99
	Long Sault				8.34	8.33	16.67		8.33	16.67
	Waterfront	176.96	176.96	353.92				176.96	176.96	353.92
Credit Valley	Bellfountain				12,500.02	12,500.00	25,000.02	12,500.02	12,500.00	25,000.02
	Conservation Services				950.00	950.00	1,900.00	950.00	950.00	1,900.00
	Limehouse				10,000.00	10,000.00	20,000.00	10,000.00	10,000.00	20,000.00
	Meadowdale				30,018.78	30,018.78	60,037.56	30,018.78	30,018.78	60,037.56
	Orangeville Reservoir				2,000.02	2,000.00	4,000.02	2,000.02	2,000.00	4,000.02
	Terra Cotta				13,200.85	13,200.82	26,401.67	13,200.85	13,200.82	26,401.67
Crowe Valley	Crowe Bridge				2,819.18	2,819.17	5,638.35	2,819.18	2,819.17	5,638.35
Ganaraska	Authority Office				350.00	350.00	700.00	350.00	350.00	700.00
Region	Ballis Mill	1,748.51	1,748.51	3,497.02				1,748.51	1,748.51	3,497.02
	Baltimore	28,691.97	28,691.97	57,383.94				28,691.97	28,691.97	57,383.94
	Cobourg	134.76	134.75	269.51				134.76	134.75	269.51
	Garden Hill				302.99	302.99	605.98	302.99	302.99	605.98
	Port Hope				900.00	900.00	1,800.00	900.00	900.00	1,800.00
	Sylvan Glen				250.00	250.00	500.00	250.00	250.00	500.00
Grand River	Bannister Lake	800.00	800.00	1,600.00				800.00	800.00	1,600.00
	Bannister/Wngley Lake				9,528.24	9,528.20	19,056.44	9,528.24	9,528.20	19,056.44
	Belwood Lake	16,399.51	16,399.51	32,799.02	7,565.86	7,565.80	15,131.66	23,965.37	23,965.31	47,930.68
	Biological Studies				4,825.61	4,825.59	9,651.20	4,825.61	4,825.59	9,651.20
	Brant				76,299.86	76,299.85	152,599.71	76,299.86	76,299.85	152,599.71
	Brantford/Paris Valley Lands				146.77	146.77	293.54	146.77	146.77	293.54
	Byng Island				28,254.82	28,254.80	56,509.62	28,254.82	28,254.80	56,509.62
	Caledonia				370.27	370.27	740.54	370.27	370.27	740.54
	Chicopee Hills	38,500.00	38,500.00	77,000.00	12,738.74	12,738.72	25,477.46	51,238.74	51,238.72	102,477.46
	Chillico Creek	33,472.09	33,472.09	66,944.18	949.70	949.70	1,899.40	34,421.79	34,421.79	68,843.58
	Conestogo Lake				25,440.82	25,440.79	50,881.61	25,440.82	25,440.79	50,881.61
	Conservation Services				3,745.22	3,745.21	7,490.43	3,745.22	3,745.21	7,490.43

CONSERVATION AREAS EXPENDITURES 1971/72 (Continued)

Provincial Grant 50%

CONSERVATION AUTHORITY	CONSERVATION AREA	LAND ACQUISITION			DEVELOPMENT			TOTALS		
		AUTHORITY	PROVINCE	TOTALS	AUTHORITY	PROVINCE	TOTALS	AUTHORITY	PROVINCE	TOTALS
	F.W.R. Dickson				1,000.00	1,000.00	2,000.00	1,000.00	1,000.00	2,000.00
	Doon				3,172.38	3,172.36	6,344.74	3,172.38	3,172.36	6,344.74
	Elora Gorge				12,550.22	12,550.20	25,100.42	12,550.22	12,550.20	25,100.42
	Elora Valley	1,250.00	1,250.00	2,500.00				1,250.00	1,250.00	2,500.00
	Eramosa Valley Lands	127,237.70	127,237.69	254,475.39				127,237.70	127,237.69	254,475.39
	Galt/Paris Valley Land	1,350.00	1,350.00	2,700.00				1,350.00	1,350.00	2,700.00
	Hanlon's Creek	61,391.34	61,391.33	122,782.67				61,391.34	61,391.33	122,782.67
	Kitchener/Waterloo	180,866.32	180,866.30	361,732.62				180,866.32	180,866.30	361,732.62
	Laurel Creek	6,127.56	6,127.55	12,255.11	29,316.15	29,316.11	58,632.26	35,443.71	35,443.66	70,887.37
	Luther Marsh	10,005.81	10,005.81	20,011.62	15,000.04	15,000.00	30,000.04	25,005.85	25,005.81	50,011.66
	Pinehurst				8,960.01	8,959.97	17,919.98	8,960.01	8,959.97	17,919.98
	Puslinch Lake				1,945.85	1,945.82	3,891.67	1,945.85	1,945.82	3,891.67
	Riches	712.50	712.50	1,425.00				712.50	712.50	1,425.00
Grand River	Rockwood				54,867.78	54,867.73	109,735.51	54,867.78	54,867.73	109,735.51
	Admin. & Central Work Shop (Shades Mill)				936.34	936.32	1,872.66	936.34	936.32	1,872.66
	Shades Mill				45,885.61	45,885.59	91,771.20	45,885.61	45,885.59	91,771.20
	Stanley Park				1,171.86	1,171.85	2,343.71	1,171.86	1,171.85	2,343.71
	Sundry Forestry Area				4,341.84	4,341.81	8,683.65	4,341.84	4,341.81	8,683.65
	Taguanyah				1,500.02	1,500.00	3,000.02	1,500.02	1,500.00	3,000.02
	Whiteman's Creek				9,826.93	9,826.90	19,653.83	9,826.93	9,826.90	19,653.83
Halton Region	Authority Forest				6,652.20	6,652.18	13,304.38	6,652.20	6,652.18	13,304.38
	Burns Nature Campbellville				431.42	431.41	862.83	431.42	431.41	862.83
	Community Pond				77.92	77.91	155.83	77.92	77.91	155.83
	Carlisle Community Pond				761.52	761.49	1,523.01	761.52	761.49	1,523.01
	Conservation Services				1,461.95	1,461.93	2,923.88	1,461.95	1,461.93	2,923.88
	Crawford Lake				1,868.66	1,868.62	3,737.28	1,868.66	1,868.62	3,737.28
	Esquesing				246.10	246.10	492.20	246.10	246.10	492.20
	Kelso				36,827.11	36,827.10	73,654.21	36,827.11	36,827.10	73,654.21
	Mount Nemo				764.28	764.26	1,528.54	764.28	764.26	1,528.54
	Mountsberg				16,897.18	16,897.16	33,794.34	16,897.18	16,897.16	33,794.34
	Rattlesnake Point				4,029.83	4,029.79	8,059.62	4,029.83	4,029.79	8,059.62
	Scotch Block				1,545.30	1,545.28	3,090.58	1,545.30	1,545.28	3,090.58
	Sixteen Mile				1,478.47	1,478.44	2,956.91	1,478.47	1,478.44	2,956.91
Hamilton Region	Ancaster/Dundas Valley				22,303.41	22,303.41	44,606.82	22,303.41	22,303.41	44,606.82
	Beverley Swamp	208.39	208.39	416.78	883.66	883.66	1,767.32	1,092.05	1,092.05	2,184.10
	Christie Dam	35,864.13	35,864.14	71,728.27	2,415.26	2,415.28	4,830.54	38,279.39	38,279.42	76,558.81
	Crooks Hollow				2,054.17	2,054.19	4,108.36	2,054.17	2,054.19	4,108.36
	Devils Punch Bowl				8,324.28	8,324.28	16,648.56	8,324.28	8,324.28	16,648.56
	Spencer Gorge				477.03	477.03	954.06	477.03	477.03	954.06
	Spring Creek	15,301.89	15,301.90	30,603.79	10,775.77	10,775.80	21,551.57	26,077.66	26,077.70	52,155.36
	Tiffany Falls				249.17	249.17	498.34	249.17	249.17	498.34

C2 CONSERVATION AREAS EXPENDITURES 1971/72 (Continued)

Provincial Grant 50%

CONSERVATION AUTHORITY	CONSERVATION AREA	LAND ACQUISITION			DEVELOPMENT			TOTALS		
		AUTHORITY	PROVINCE	TOTALS	AUTHORITY	PROVINCE	TOTALS	AUTHORITY	PROVINCE	TOTALS
	Valens				12,234.03	12,234.05	24,468.08	12,234.03	12,234.05	24,468.08
	Private Reforestation Assistance				276.83	276.83	553.66	276.83	276.83	553.66
	Spencer Gorge				272.97	272.97	545.94	272.97	272.97	545.94
Junction Creek	Garson				5.23	5.23	10.46	5.23	5.23	10.46
	New Sudbury				7,771.02	7,771.03	15,542.05	7,771.02	7,771.03	15,542.05
Kettle Creek	Belmont	1,381.03	1,381.02	2,762.05	2,340.41	2,340.42	4,680.83	3,721.44	3,721.44	7,442.88
	Conservation Services				289.25	289.25	578.50	289.25	289.25	578.50
	Lake Whittaker	53,913.17	53,913.18	107,826.35	293.46	293.46	586.92	54,206.63	54,206.64	108,413.27
Lakehead Region	Cascades				999.27	999.27	1,998.54	999.27	999.27	1,998.54
	Conservation Services				81.12	81.13	162.25	81.12	81.13	162.25
	Hazelwood Lake	972.05	972.05	1,944.10	9,097.15	9,097.17	18,194.32	10,069.20	10,069.22	20,138.42
	Hurkett Cove	4,590.85	4,590.85	9,181.70				4,590.85	4,590.85	9,181.70
	MacKenzie	41.32	41.33	82.65				41.32	41.33	82.65
Long Point Region	Backus				1,290.00	1,290.00	2,580.00	1,290.00	1,290.00	2,580.00
	Deer Creek				2,419.42	2,419.42	4,838.84	2,419.42	2,419.42	4,838.84
	Fisher	2,310.10	2,310.10	4,620.20				2,310.10	2,310.10	4,620.20
	Hay Creek				500.00	500.00	1,000.00	500.00	500.00	1,000.00
	Norfolk				500.00	500.00	1,000.00	500.00	500.00	1,000.00
	Norwich				337.41	337.39	674.80	337.41	337.39	674.80
	Port Burwell				485.00	485.00	970.00	485.00	485.00	970.00
	Port Royal Waterfowl	289.63	289.62	579.25				289.63	289.62	579.25
	Private Tree Planting				101.37	101.37	202.74	101.37	101.37	202.74
	Sundry				801.97	801.96	1,603.93	801.97	801.96	1,603.93
	Waterford				2,721.44	2,721.43	5,442.87	2,721.44	2,721.43	5,442.87
Lower Thames Valley	Big Bend				846.04	846.01	1,692.05	846.04	846.01	1,692.05
	Conservation Services				171.00	171.00	342.00	171.00	171.00	342.00
	Delaware				17.00	17.00	34.00	17.00	17.00	34.00
	Harwick				358.57	358.55	717.12	358.57	358.55	717.12
	Highway 401				614.02	614.01	1,228.03	614.02	614.01	1,228.03
	Longwoods Road				1,408.55	1,408.52	2,817.07	1,408.55	1,408.52	2,817.07
	Millstream				69.50	69.50	139.00	69.50	69.50	139.00
Lower Thames Valley	Sharon Creek	15,278.70	15,278.69	30,557.39	1,685.97	1,685.96	3,371.93	16,964.67	16,964.65	33,929.32
	Thames Grove				842.43	842.42	1,684.85	842.43	842.42	1,684.85
Lower Trent Region	401 Strip				72.50	72.50	145.00	72.50	72.50	145.00
	Hoards	3,441.71	3,441.70	6,883.41				3,441.71	3,441.70	6,883.41
	King's Mill				350.00	350.00	700.00	350.00	350.00	700.00
	Proctor Park				739.05	739.05	1,478.10	739.05	739.05	1,478.10
	Frank Goodrich	21,205.18	21,205.18	42,410.36				21,205.18	21,205.18	42,410.36
	Sager Oak Hills	5,359.14	5,359.13	10,718.27				5,359.14	5,359.13	10,718.27

CONSERVATION AREAS EXPENDITURES 1971/72 (Continued)

Provincial Grant 50%

CONSERVATION AUTHORITY	CONSERVATION AREA	LAND ACQUISITION			DEVELOPMENT			TOTALS		
		AUTHORITY	PROVINCE	TOTALS	AUTHORITY	PROVINCE	TOTALS	AUTHORITY	PROVINCE	TOTALS
Maitland Valley	Falls Reserve				2,151.01	2,151.02	4,302.03	2,151.01	2,151.02	4,302.03
	Gorrie				1,356.25	1,356.25	2,712.50	1,356.25	1,356.25	2,712.50
	Pioneer				1,751.94	1,751.94	3,503.88	1,751.94	1,751.94	3,503.88
	Wroxeter				235.68	235.66	471.34	235.68	235.66	471.34
Mattagami Valley	Gillies Lake	301.47	301.48	602.95				301.47	301.48	602.95
Metro Toronto & Region	Albion Hills				22,742.22	22,742.20	45,484.42	22,742.22	22,742.20	45,484.42
	Black Creek				30,809.09	30,809.07	61,618.16	30,809.09	30,809.07	61,618.16
	Boyd				19,071.46	19,071.44	38,142.90	19,071.46	19,071.44	38,142.90
	Bruce's Mill				13,918.75	13,918.74	27,837.49	13,918.75	13,918.74	27,837.49
	Claireville				117,736.11	117,736.09	235,472.20	117,736.11	117,736.09	235,472.20
	Claremont				6,442.87	6,442.84	12,885.71	6,442.87	6,442.84	12,885.71
	Cold Creek				8,049.32	8,049.29	16,098.61	8,049.32	8,049.29	16,098.61
	Conservation Services				16,451.03	16,451.02	32,902.05	16,451.03	16,451.02	32,902.05
	Frenchman's Bay	10,518.01	10,518.00	21,036.01	3,520.18	3,520.18	7,040.36	14,038.19	14,038.18	28,076.37
	Glen Haffy				12,458.96	12,458.94	24,917.90	12,458.96	12,458.94	24,917.90
	Greenwood				6,963.95	6,963.94	13,927.89	6,963.95	6,963.94	13,927.89
	Heart Lake				19,429.90	19,429.87	38,859.77	19,429.90	19,429.87	38,859.77
	Humber Trails				1,535.80	1,535.79	3,071.59	1,535.80	1,535.79	3,071.59
	King Creek Forest and Wildlife	21.07	21.06	42.13				21.07	21.06	42.13
	Lake St. George	385.04	385.03	770.07	2,013.31	2,013.31	4,026.62	2,398.35	2,398.34	4,796.69
Mississippi Valley	Lower Rouge				4,921.34	4,921.32	9,842.66	4,921.34	4,921.32	9,842.66
	Milne				45,663.42	45,663.39	91,326.81	45,663.42	45,663.39	91,326.81
	Palgrave Forest and Wildlife	947.77	947.76	1,895.53				947.77	947.76	1,895.53
	Peter Wright Forest and Wildlife	644.56	644.56	1,289.12	72.56	72.55	145.11	717.12	717.11	1,434.23
	Woodbridge				1,983.66	1,983.64	3,967.30	1,983.66	1,983.64	3,967.30
	Authority Office	2,432.57	2,432.58	4,865.15	1,000.00	1,000.00	2,000.00	3,432.57	3,432.58	6,865.15
Moir River	Conservation Services				130.04	130.04	260.08	130.04	130.04	260.08
	Scenic Routes				382.41	382.39	764.80	382.41	382.39	764.80
	Ackerman	26.25	26.25	52.50				26.25	26.25	52.50
Napane Region	O'Hara Mill				497.79	497.78	995.57	497.79	497.78	995.57
	Sundry				485.78	485.78	971.56	485.78	485.78	971.56
	Thurlow				894.72	894.71	1,789.43	894.72	894.71	1,789.43
	Col. Roscoe									
	Vanderwater				3,659.19	3,659.17	7,318.36	3,659.19	3,659.17	7,318.36
Niagara Peninsula	Forest Mills				500.00	500.00	1,000.00	500.00	500.00	1,000.00
	Office Re-Location				694.57	694.56	1,389.13	694.57	694.56	1,389.13
	Portland				272.77	272.77	545.54	272.77	272.77	545.54
	Newburgh				225.00	225.00	450.00	225.00	225.00	450.00
	Second Depot Lake				882.23	882.23	1,764.46	882.23	882.23	1,764.46
Niagara Peninsula	Balls Falls				485.38	485.36	970.74	485.38	485.36	970.74
	Binbrook				3,592.99	3,592.99	7,185.98	3,592.99	3,592.99	7,185.98

CONSERVATION AREAS EXPENDITURES 1971/72 (Continued)

Provincial Grant 50%

CONSERVATION AUTHORITY	CONSERVATION AREA	LAND ACQUISITION			DEVELOPMENT			TOTALS		
		AUTHORITY	PROVINCE	TOTALS	AUTHORITY	PROVINCE	TOTALS	AUTHORITY	PROVINCE	TOTALS
	Chippawa Creek				354.43	354.42	708.85	354.43	354.42	708.85
	Conservation Services				425.00	425.00	850.00	425.00	425.00	850.00
	Long Beach				984.80	984.79	1,969.59	984.80	984.79	1,969.59
	Maple Syrup Demonstration				711.53	711.52	1,423.05	711.53	711.52	1,423.05
	Stevensville				218.51	218.51	437.02	218.51	218.51	437.02
	Virgil Reservoir				640.59	640.58	1,281.17	640.59	640.58	1,281.17
North Grey Region	Ainslie Wood				2,250.00	2,250.00	4,500.00	2,250.00	2,250.00	4,500.00
	Beaver Valley				691.10	691.10	1,382.20	691.10	691.10	1,382.20
	Eugenia Falls				2,928.18	2,928.17	5,856.35	2,928.18	2,928.17	5,856.35
	Flesherton	5,883.75	5,883.75	11,767.50				5,883.75	5,883.75	11,767.50
	Inglis Falls	7,000.00	7,000.00	14,000.00	490.51	490.50	981.01	7,490.51	7,490.50	14,981.01
	Meaford				907.67	907.65	1,815.32	907.67	907.65	1,815.32
	Pottawatomie				203.14	203.14	406.28	203.14	203.14	406.28
Nottawasaga Valley	Boyne River Green Belt	1,315.00	1,315.00	2,630.00				1,315.00	1,315.00	2,630.00
	Carruthers Memorial				2,326.14	2,326.08	4,652.22	2,326.14	2,326.08	4,652.22
	Conservation Services				92.96	92.95	185.91	92.96	92.95	185.91
	Edenvale				1,568.01	1,567.99	3,136.00	1,568.01	1,567.99	3,136.00
	Minesing Swamp	55,747.23	55,747.22	111,494.45				55,747.23	55,747.22	111,494.45
	New Lowell	5,000.00	5,000.00	10,000.00	988.05	988.05	1,976.10	5,988.05	5,988.05	11,976.10
	Osprey				387.19	387.17	774.36	387.19	387.17	774.36
	Tiffin				1,366.31	1,366.31	2,732.62	1,366.31	1,366.31	2,732.62
	Tottenham				4,963.54	4,963.51	9,927.05	4,963.54	4,963.51	9,927.05
	Utopia				3,960.13	3,960.11	7,920.24	3,960.13	3,960.11	7,920.24
Otonabee Region	Cavan Swamp	162.06	162.06	324.12	2.32	2.32	4.64	164.38	164.38	328.76
	Conservation Services Assistance				292.32	292.32	584.64	292.32	292.32	584.64
	Lang Mill				652.94	652.94	1,305.88	652.94	652.94	1,305.88
	North Monaghan Park				405.65	405.65	811.30	405.65	405.65	811.30
	Norwood	3,239.16	3,239.15	6,478.31				3,239.16	3,239.15	6,478.31
	Office Relocation				1,529.07	1,529.06	3,058.13	1,529.07	1,529.06	3,058.13
	Peterborough Waterfront	37.40	37.39	74.79				37.40	37.39	74.79
	Sawer Creek	73.84	73.83	147.67				73.84	73.83	147.67
Otonabee Region	Squirrel Creek				4,195.30	4,195.28	8,390.58	4,195.30	4,195.28	8,390.58
	Sundry Areas				2,053.82	2,053.82	4,107.64	2,053.82	2,053.82	4,107.64
	Warsaw Caves	1,592.23	1,592.22	3,184.45	10,585.28	10,585.25	21,170.53	12,177.51	12,177.47	24,354.98
	Waysides Management				250.00	250.00	500.00	250.00	250.00	500.00
	Whitfield Landing				596.36	596.36	1,192.72	596.36	596.36	1,192.72
	Young's Point	18,926.33	18,926.32	37,852.65	891.44	891.43	1,782.87	19,817.77	19,817.75	39,635.52
Prince Edward Region	MacAuley Mountain/ Picton				2,387.37	2,387.37	4,774.74	2,387.37	2,387.37	4,774.74
	Massassaga Point	11,000.24	11,000.23	22,000.47				11,000.24	11,000.23	22,000.47
Raisin Region	Gray's Creek	16,934.95	16,934.96	33,869.91				16,934.95	16,934.96	33,869.91
Rideau Valley	Aquatic Weed Control				3,571.84	3,571.84	7,143.68	3,571.84	3,571.84	7,143.68

CONSERVATION AUTHORITY	CONSERVATION AREA	LAND ACQUISITION			DEVELOPMENT			TOTALS		
		AUTHORITY	PROVINCE	TOTALS	AUTHORITY	PROVINCE	TOTALS	AUTHORITY	PROVINCE	TOTALS
	Authority Office & Furnishings				151.01	151.00	302.01	151.01	151.00	302.01
	Authority Workshop				1,064.29	1,064.28	2,128.57	1,064.29	1,064.28	2,128.57
	Baxter	10,862.53	10,862.52	21,725.05	2,495.00	2,495.00	4,990.00	13,357.53	13,357.52	26,715.05
	Foley Mountain	13,006.19	13,006.19	26,012.38	1,651.64	1,651.61	3,303.25	14,657.83	14,657.80	29,315.63
	Mill Bay				10,970.82	10,970.80	21,941.62	10,970.82	10,970.80	21,941.62
	Mill Pond	7,410.22	7,410.21	14,820.43	2,800.01	2,800.00	5,600.01	10,210.23	10,210.21	20,420.44
	Perth Wildlife	6,813.47	6,813.46	13,626.93	4,047.08	4,047.07	8,094.15	10,860.55	10,860.53	21,721.08
Sauble Valley	Indian Falls				2,600.00	2,600.00	5,200.00	2,600.00	2,600.00	5,200.00
	St. Jean's Point	7,652.94	7,652.94	15,305.88				7,652.94	7,652.94	15,305.88
	Skinner Bluffs				386.89	386.88	773.77	386.89	386.88	773.77
	Sundry				370.77	370.76	741.53	370.77	370.76	741.53
Saugeen Valley	Allan Park				65.86	65.86	131.72	65.86	65.86	131.72
	Authority Headquarters and Wildlife	7,812.00	7,812.00	15,624.00	2,485.33	2,485.33	4,970.66	10,297.33	10,297.33	20,594.66
	Bruceville	935.39	935.39	1,870.78	2,733.53	2,733.51	5,467.04	3,668.92	3,668.90	7,337.82
	Durham				2,335.00	2,335.00	4,670.00	2,335.00	2,335.00	4,670.00
	Hehn Wildlife	1,215.00	1,215.00	2,430.00				1,215.00	1,215.00	2,430.00
	Lockerby Mill				2,471.00	2,471.00	4,942.00	2,471.00	2,471.00	4,942.00
	Private Tree Planting				1,631.90	1,631.89	3,263.79	1,631.90	1,631.89	3,263.79
	Sundry Areas: Mildmay, Carrick, & Varney				470.00	470.00	940.00	470.00	470.00	940.00
Sault Ste. Marie Region	Fort Creek				1,090.81	1,090.81	2,181.62	1,090.81	1,090.81	2,181.62
	Fort Creek, Water Study				391.87	391.88	783.75	391.87	391.88	783.75
South Lake Simcoe	Clubine	62.50	62.50	125.00				62.50	62.50	125.00
	Conservation Services				215.76	215.77	431.53	215.76	215.77	431.53
	Mabel Davis				1,737.65	1,737.65	3,475.30	1,737.65	1,737.65	3,475.30
	Scanlon Creek	1,480.50	1,480.50	2,961.00	13,727.41	13,727.41	27,454.82	15,207.91	15,207.91	30,415.82
	Sundry				3,260.10	3,260.11	6,520.21	3,260.10	3,260.11	6,520.21
Sydenham Valley	Campbell				8,835.68	8,835.72	17,671.40	8,835.68	8,835.72	17,671.40
	Cold Stream	883.05	883.05	1,766.10	10,523.74	10,523.75	21,047.49	11,406.79	11,406.80	22,813.59
	Conservation Services				44.50	44.50	89.00	44.50	44.50	89.00
	Melwood Park	240.90	240.91	481.81				240.90	240.91	481.81
	Petrolia	1,529.16	1,529.16	3,058.32	3,432.24	3,432.25	6,864.49	4,961.40	4,961.41	9,922.81
	Running Creek	770.14	770.15	1,540.29	7,450.06	7,450.07	14,900.13	8,220.20	8,220.22	16,440.42
	Shetland				598.36	598.36	1,196.72	598.36	598.36	1,196.72
	Warwick-Petrolia- Shetland				445.70	445.71	891.41	445.70	445.71	891.41
Upper Thames River	Conservation Services				972.22	972.23	1,944.45	972.22	972.23	1,944.45
	Embro				750.00	750.00	1,500.00	750.00	750.00	1,500.00
	Fanshawe				30,915.79	30,915.80	61,831.59	30,915.79	30,915.80	61,831.59
	Kirkton				1,192.60	1,192.60	2,385.20	1,192.60	1,192.60	2,385.20
	Pittcock				8,115.86	8,115.86	16,231.72	8,115.86	8,115.86	16,231.72

C2 CONSERVATION AREAS EXPENDITURES 1971/72 (Continued)

Provincial Grant 50%

CONSERVATION AUTHORITY	CONSERVATION AREA	LAND ACQUISITION			DEVELOPMENT			TOTALS		
		AUTHORITY	PROVINCE	TOTALS	AUTHORITY	PROVINCE	TOTALS	AUTHORITY	PROVINCE	TOTALS
	Shakespeare				751.08	751.07	1,502.15	751.08	751.07	1,502.15
	Wildwood				34,576.57	34,576.55	69,153.12	34,576.57	34,576.55	69,153.12
Whitson Valley	Second Whitson Lake				17,256.65	17,256.65	34,513.30	17,256.65	17,256.65	34,513.30
TOTALS		964,413.20	964,412.98	1,928,826.18	1,262,838.20	1,262,836.41	2,525,674.61	2,227,251.40	2,227,249.39	4,454,500.79

C3 TORONTO WATERFRONT

AUTHORITY	PROJECT	LAND ACQ.	ENG.	DEVT.	AUTH.	PROV.
Credit Valley	Mississauga Waterfront			6,890.11	3,445.06	3,445.05
Metro Toronto & Region	Ashbridges Bay			193,078.05	96,539.03	96,539.02
	Mimico Creek			124,754.37	62,377.19	62,377.18
	Pickering/Ajax	976,386.36			488,193.19	488,193.17
	Planning Studies and Shore Line		67,889.49		33,944.75	33,944.74
	Primary Inventory Report		7,500.00		3,750.00	3,750.00
	Scarborough Bluffs	273,134.06			136,567.04	136,567.02
TOTALS		1,249,520.42	75,389.48	324,722.53	824,816.26	824,816.18

C4 NIAGARA ESCARPMENT LAND ACQUISITIONS

Cost Sharing: Authority 25%/Ontario 75%

AUTHORITY	AUTHORITY	PROVINCE	TOTAL
Credit Valley	61,898.65	185,695.92	247,594.57
Halton Region	19,817.64	59,452.91	79,270.55
Hamilton Region	87,675.54	263,026.59	350,702.13
Metro Toronto & Region	26,415.57	79,246.68	105,662.25
North Grey Region	25,918.52	77,755.46	103,673.98
Nottawasaga Valley	38,796.25	116,388.75	155,185.00
Sauble Valley	7,732.17	23,196.45	30,928.62
TOTALS	268,254.34	804,762.76	1,073,017.10

Forestry and Land Use

C5

CONSERVATION AUTHORITY FOREST ACREAGE

AUTHORITY	ACREAGE PURCHASED 1971-72 FISCAL YEAR	TOTAL ACREAGE MARCH 31, 1972
Ausable/Bayfield		4,396
Catfish Creek		627
Central Lake Ontario		295
Crowe Valley		200
Ganaraska Region		8,736
Grand River		5,768
Hamilton Region		12
Lakehead Region		1,665
Long Point Region	260	5,726
Lower Thames Valley		308
Maitland Valley		949
Metro Toronto & Region		1,673
Moirs River		16,517
Napanee Region		6,749
Niagara Peninsula		186
North Grey Region		6,948
Otonabee Region		2,220
Sauble Valley		3,818
Saugeen Valley	304	12,875
South Nation River	532	4,499
Sydenham Valley		150
Upper Thames River		3,359

C6

ESTABLISHED DEMONSTRATION AREAS

AUTHORITY	DEMONSTRATION PROJECT	NUMBER
Ausable/Bayfield	Grass Waterways	2
	Gully Erosion Control	1
	Streambank Erosion Control	1
	Grass Waterways	2
	Gully Erosion Control	1
Central Lake Ontario	Streambank Erosion Control	4
	Soil Management	1
	Grass Waterway	1
	Gully Erosion Control	1
	Streambank Erosion Control	1
Grand River	Grass Waterway	2
	Gully Erosion Control	1
	Streambank Erosion Control	1
	Hillside Erosion Control	1
	Grass Waterway	1
Halton Region	Streambank Erosion Control	5
	Soil Management	1
	Demonstration Pasture	1
	Streambank Erosion Control	1
	Grass Waterway	1
Kettle Creek	Gully Erosion Control	2
	Streambank Erosion Control	15
	Demonstration Pasture	3
	Soil Management	3
Maitland Valley	Grass Waterway	1
	Gully Erosion Control	2
	Streambank Erosion Control	1
	Demonstration Pasture	3
	Soil Management	3
Metro Toronto • Region	Grass Waterway	1
	Gully Erosion Control	2
	Streambank Erosion Control	1
	Demonstration Pasture	3
	Soil Management	3
Saugeen Valley	Grass Waterway	1
	Gully Erosion Control	2
	Streambank Erosion Control	1
	Demonstration Pasture	3
	Soil Management	3
South Lake Simcoe	Grass Waterway	1
	Gully Erosion Control	2
	Streambank Erosion Control	1
	Demonstration Pasture	3
	Soil Management	3
Sydenham Valley	Grass Waterway	1
	Gully Erosion Control	2
	Streambank Erosion Control	1
	Demonstration Pasture	3
	Soil Management	3

Parks Assistance Act

C7

PARKS ASSISTANCE (To Mar. 31st 1972)

	MUN.	PROV.	TOTAL
Amabel/township	18,667.20	18,667.19	37,334.39
Atikokan/town	5,893.69	5,893.68	11,787.37
Barrie/city	18,922.75	18,922.75	37,845.49
Bastard & South Burgess/township	11,436.67	11,436.68	22,873.35
Bexley/township	4,272.13	4,272.14	8,544.27
Burlington/town	13,416.07	13,416.06	26,832.13
Chinquacousy/township	15,813.15	15,813.15	31,626.30
Cobalt/town	3,360.68	3,360.67	6,721.35
Cobourg/town	16,784.83	16,784.83	33,569.67
Cochrane/town	7,309.33	7,309.32	14,618.65
Drury Dennison & Graham/township	1,021.87	1,021.86	2,043.73
Dryden/town	2,941.51	2,941.50	5,883.01
Elliott Lake/I.D.	2,000.00	2,000.00	4,000.00
Essa/township	2,236.80	2,236.79	4,473.59
Guelph/township	6,653.95	6,653.95	13,307.90
Hamilton/city	80,995.46	80,995.46	161,990.92
Huntsville/town	2,461.00	2,461.00	4,922.00
Innisfil/township	12,320.76	12,320.74	24,641.50
Kettle Point/reserve	2,753.89	2,753.89	5,507.78
Lakefield/village	1,558.89	1,558.89	3,117.78
Lion's Head/village	5,325.45	5,325.45	10,650.90
Little Current/town	5,462.75	5,462.75	10,925.50
L'Orignal/village	1,504.44	1,504.43	3,008.87
Marmora/village	3,870.90	3,870.89	7,741.79

Moore/township	10,400.95	10,400.95	20,801.90
Mountjoy/township	6,758.28	6,758.27	13,516.55
Nichol/township	4,750.09	4,750.09	9,500.18
Omeme/village	2,725.68	2,725.67	5,451.35
Orillia/city	2,616.57	2,616.57	5,233.14
Owen Sound/city	3,876.00	3,875.99	7,751.99
Pelee/township	6,000.00	6,000.00	12,000.00
Penetanguishene/town	680.63	680.63	1,361.26
Perth/town	8,314.39	8,314.39	16,628.78
Peterborough/city	16,996.74	16,996.74	33,993.48
Pittsburgh/township	25,000.00	25,000.00	50,000.00
Port Credit/town	48,805.44	48,805.44	97,610.88
Port Perry/village	6,115.59	6,115.58	12,231.17
Rayside/township	3,835.48	3,835.48	7,670.96
Richmond Hill/town	3,063.95	3,063.95	6,127.90
Sarnia/city	7,592.59	7,592.58	15,185.17
Sarnia/city and township	2,107.89	2,107.88	4,215.77
Sault Ste. Marie/city	8,625.89	8,625.88	17,251.77
Six Nations/reserve	1,144.93	1,144.93	2,289.86
Smiths Falls/town	5,696.78	5,696.78	11,393.56
Thunder Bay/city	1,092.20	1,092.20	2,184.40
Tillsonburg/town	17,716.41	17,716.41	35,432.82
Warton/town	20,365.26	20,365.26	40,730.52
Wingham/town	692.50	692.50	1,385.00
TOTALS	461,958.41	461,958.24	923,916.65

C8

CONSERVATION LANDS

CONSERVATION AUTHORITY	NUMBER OF CONSERVATION AREAS	TOTAL ACRES DEC. 31, 1971	ACRES ACQUIRED 1971-72
Ausable/Bayfield	7	2,079	
Cataraqui	11	3,875	155.2
Catfish Creek	6	731	638
Central Lake Ontario			
Credit Valley	10	2,069	168
Crowe Valley			
Ganaraska	6	203	
Grand River	32	26,476	37
Halton	13	3,376	137
Hamilton			
Junction Creek	5	4,105	
Kettle Creek	2	108	96
Lakehead	6	3,113	
Long Point	22	1,615	109
Lower Thames	8	533	5
Lower Trent	5	205	4
Maitland Valley	10	925	5
Mattagami Valley			
MTRCA	29	13,295	
Mississippi Valley			
Moirs River	8	2,488	
Napanee	7	5,311	975
Niagara	10	2,785	1,052
North Grey	18	2,019	993
Nottawasaga	8	931	
Otonabee			
Prince Edward	4	421	
Raisin			
Rideau Valley	4	1,638	
Sauble Valley	19	5,488	
Saugeen Valley	12	647	63
Sault Ste. Marie	1	177	
South Lake Simcoe	8	717	58
South Nation River			
Sydenham Valley	7	814	70
Upper Thames River	15	7,854	
Whitson Valley	2	43	
Totals:	295	94,041	4,565

C9

ATTENDANCE AT CONSERVATION AREAS

CONSERVATION AUTHORITY	TOTAL USERS 1971	TOTAL CARS 1971	NO. OF AREAS WITH CAMP SITES	NO. OF CAMP SITES	NO. OF GROUP CAMP SITES	CAMPER/ DAYS
Ausable/Bayfield	89,600	20,260	1	116	0	2,700
Cataraqui	7,190	1,995	1	24	2	500
Catfish Creek	25,000	95,000	1	76	0	175
Central Lake Ontario						
Credit Valley	*100,536	31,655	2	150	3	
Crowe Valley						
Ganaraska	*12,800	3,400	1	30	0	848
Grand	*656,220	113,215	7	805	8	89,716
Halton	308,050	81,271	3		34	28
Hamilton						
Junction Creek	10,000	2,500				
Kettle Creek	400	100				
Lakehead	9,200	2,300				
Long Point	*169,917	38,437	5	360		6,958
Lower Thames	19,900	7,200	3	61		300
Lower Trent						
Maitland Valley	*18,570	3,741	1	68	2	1,945
Mattagami Valley						
MTRCA	*1,552,319	272,352	2	120	16	1,488
Mississippi Valley						
Moirs River	28,940	7,575	1	56	10	840
Napanee	*1,000	300	1	30	5	148
Niagara Peninsula	141,000					
North Grey	112,200	31,500				
Nottawasaga	18,438	2,830	5	100	4	77
Otonabee						
Prince Edward			1	50		
Raisin						
Rideau						
Sauble Valley	29,300	7,575				
Saugeen Valley	69,700	20,400	2	180		1,900
Sault Ste. Marie	9,500	3,500				
South Nation River						
Sydenham Valley	37,200	8,350				
Upper Thames River	*243,054	114,100	3	873	10	45,800
Whitson Valley	1,500	500				
TOTALS	3,705,034	877,206	40	3,099	92	153,423

*Not all areas have estimated users

Water Management

C10

WATER CONTROL PROJECTS

FLOOD PLAIN LANDS

Cost Sharing: Authority 50%/Ontario 50%

AUTHORITY	PROJECT	AUTHORITY	PROVINCE	TOTAL
Central Lake Ontario	Oshawa Creek Valley	311.45	311.44	622.89
Grand River	Caledonia	1,104.35	1,104.35	2,208.70
Grand River	Galt-Paris Area	980.94	980.94	1,961.88
Grand River	Guelph Dam & Reservoir	522,739.53	522,739.54	1,045,479.07
Grand River	New Hamburg (Village)	363.82	363.82	727.64
Grand River	Nith River	72.50	72.50	145.00
Hamilton Region	Redhill Creek	75,783.64	75,783.64	151,567.28
Lakehead Region	McVicar's Creek	190.03	190.03	380.06
Mattagami Valley	Mount Joy (Township)	130,821.86	130,821.85	261,643.71
Metro Toronto & Region	Flood Plain Lands	179,949.98	179,949.96	359,899.94
Moira River	Belleville (City)	74,048.22	74,048.19	148,096.41
North Grey Region	Beaver River	1,191.30	1,191.30	2,382.60
Upper Thames River	London Flood Control	77,476.27	77,476.27	154,952.54
TOTALS		1,065,033.89	1,065,033.83	2,130,067.72

C11

WATER CONTROL PROJECTS

CHANNEL IMPROVEMENTS

Cost Sharing: Authority 50%/Ontario 50%

AUTHORITY	PROJECT	AUTHORITY	PROVINCE	TOTAL
Ausable/Bayfield	Exeter Erosion Control	2,611.84	2,611.85	5,223.69
	Grand Bend	10,920.91	10,920.91	21,841.82
Catawqui Region	Hydrologic Gauges (Gananoque Region)	2.99	2.99	5.98
Cattfish Creek	Yarmouth Township	2,500.00	2,500.00	5,000.00
Credit Valley	Credit River	34.50	34.50	69.00
	Erindale Woodland	851.30	851.30	1,702.60
	Mains Creek	312.55	312.55	625.10
Ganaraska Region	Ganaraska River	500.00	500.00	1,000.00
Grand River	City of Brantford	33,748.55	33,748.54	67,497.09
	Nith River	64,217.83	64,217.78	128,435.61
	Schneider's Creek	26,263.35	26,263.32	52,526.67
Halton Region	Kelso	2,144.28	2,144.26	4,288.54
	Morrison-Wedgewood Diversion	48,885.20	48,885.20	97,770.40
	Sixteen Mile Creek (Milton)	13,825.38	13,825.34	27,650.72
Hamilton Region	Delsey St. Channel	3,601.54	3,601.56	7,203.10
Kettle Creek	Dodd Creek	153.17	153.16	306.33
Lakehead Region	McIvar's Creek	3,471.40	3,471.40	6,942.80
	Neebing River	3,510.25	3,510.26	7,020.51
	Pennock Creek	605.26	605.26	1,210.52
Lower Thames Valley	Tilbury Flood Relief	1,600.03	1,600.03	3,200.06

WATER CONTROL PROJECTS (Continued)

	Thames River (Twp. of Dover)	4,282.67	4,282.66	8,565.33
Mattagami Valley	Emergency Flood Control	320.74	320.75	641.49
	Gillies Lake	3,357.03	3,357.03	6,714.06
Metro Toronto & Region	Don River	81,859.00	81,858.99	163,717.99
	Highland Creek	75,000.01	75,000.00	150,000.01
	Massey Creek (Eglinton-Pharmacy)	321.41	321.41	642.82
	Mimico Creek (Malton)	4,860.79	4,860.79	9,721.58
	Rouge River	39,100.77	39,100.77	78,201.54
Moira River	Deer Creek	625.00	624.99	1,249.99
Napanee Region	Napanee River	19,013.90	19,013.90	38,027.80
North Grey Region	Inglis Falls	2,388.38	2,388.37	4,776.75
Nottawasaga Valley	Essa Park	148.00	148.00	296.00
	Nottawasaga River (Collingwood)	19,931.29	19,931.30	39,862.59
Otonabee Region	Hastings	831.84	831.83	1,663.67
	Otonabee River Banks	523.03	523.02	1,046.05
Saugeen Valley	Saugeen River (Brant Twp.)	9,125.65	9,125.63	18,251.28
	Saugeen River (Town of Durham)	3,065.55	3,065.54	6,131.09
	Saugeen River (Walkerton)	457.79	457.77	915.56
Sault Ste. Marie Region	East Davignon Creek	3,905.48	3,905.48	7,810.96
	Clark Creek	10,736.08	10,736.09	21,472.17
South Lake Simcoe	Newmarket and Aurora	123.32	123.33	246.65
	Schomberg Bank	807.59	807.59	1,615.18
South Nation River	Plantagenet	10,955.31	10,955.30	21,910.61
	South Nation River (near Lemieux)	1,000.00	1,000.00	2,000.00
Sydenham Valley	Boland Retaining Wall	15.87	15.88	31.75
	Brander Retaining Wall	1,883.76	1,883.77	3,767.53
	Crundwell Retaining Wall	12.91	12.91	25.82
	Emily Street Retaining Wall	2,753.73	2,753.74	5,507.47
	Flood Control Emergency	23.00	23.00	46.00
	Keith Retaining Wall	4,384.04	4,384.05	8,768.09
	Labadie Retaining Wall	501.91	501.92	1,003.83
	McDonald Retaining Wall	6.50	6.50	13.00
	Reaume Retaining Wall	38.39	38.39	76.78
	Running Creek	4,262.03	4,262.04	8,524.07
	Rupert Retaining Wall	32.37	32.38	64.75
	Stonehouse Retaining Wall	26.16	26.18	52.34
	Sydenham River (Wallaceburg)	12.00	12.00	24.00
	Sydenham River (Riverview Cemetery)	12,953.09	12,953.09	25,906.18
	Webb Retaining Wall	82.00	82.00	164.00
Upper Thames River	Springbank Erosion Control	10,505.30	10,505.28	21,010.58
Whitson Valley	Bunker Street Channel	4,112.67	4,112.66	8,225.33
TOTALS		554,106.69	554,106.54	1,108,213.23

C13

WATER CONTROL PROJECTS

PROVINCIAL/AUTHORITY AGREEMENTS

Cost Sharing: Authority 50%/Ontario 50% under Canada Department of Energy,
Mines and Resources

Metro Toronto & Region

PROJECT	LAND	MISC.	TOTAL	AUTHORITY	PROVINCE
Don	77,894.22	156.33	78,050.55	39,025.28	39,025.27
Duffin	8,681.02	919.04	9,600.06	4,800.03	4,800.03
Etobicoke	1,603.17	4.24	1,607.41	803.71	803.70
Highland Creek	7,584.10	20.07	7,604.17	3,802.10	3,802.07
Humber	92,167.54	494.11	92,661.65	46,330.85	46,330.80
Mimico	6,292.95	30.20	6,323.15	3,161.58	3,161.57
Rouge	232,282.17	1,623.75	233,905.92	116,952.97	116,952.95
TOTALS	426,505.17	3,247.74	429,752.91	214,876.52	214,876.39

C12

WATER CONTROL PROJECTS DAMS: CONSTRUCTION AND IMPROVEMENTS

Cost Sharing: Authority 50%/Ontario 50%

AUTHORITY	PROJECT	AUTHORITY	PROVINCE	TOTAL
Grand River	New Dundee Dam	102,481.94	102,481.94	204,963.88
Sault Ste. Marie Region	Fort Creek Dam	800.25	800.25	1,600.50
TOTALS		103,282.19	103,282.19	206,564.38

C14

WATER CONTROL PROJECTS UNDER CANADA DEPARTMENT OF ENERGY, MINES AND RESOURCES
FEDERAL/PROVINCIAL/AUTHORITY/AGREEMENT

Cost Sharing: Authority 25%/Ontario 37½%/Canada 37½%

AUTHORITY	PROJECT	ENGINEERING	LAND	MISC.	TOTAL	AUTHORITY	PROVINCE	FEDERAL
Metro Toronto & Region	Bolton Reservoir	20,703.05	11,860.57	601.54	33,165.16	8,522.90	12,436.89	12,205.37
	Boyd Reservoir		3,301.00	5.57	3,306.57	828.74	1,239.95	1,237.88
	Ebenezer Reservoir		290,854.56	526.17	291,380.73	73,518.02	109,267.74	108,594.97
	Finch Reservoir	96,445.72	2,208.67	587.76	99,242.15	25,030.99	37,215.76	36,995.40
	Nashville Reservoir		287,169.11	531.78	287,700.89	72,930.91	107,887.82	106,882.16
	Willowdale Reservoir		37,970.02	69.51	38,039.53	9,553.78	14,264.78	14,220.97
	Woodbridge Channel		684.60		684.60	171.15	256.72	256.73
	Gordon Pittock Dam		242.50	1,613.15	1,855.65	1,068.84	695.87	90.94
Upper Thames River	Stratford Channel	685.00			685.00	171.25	256.87	256.88
TOTALS		117,833.77	634,291.03	3,935.48	756,060.28	191,796.58	283,522.40	280,741.30

C15

WATER CONTROL PROJECTS

RECREATION RESERVOIRS

Provincial/Authority Agreements

AUTHORITY	PROJECT	LAND ACQUISITION	MISC.	TOTAL	AUTHORITY	PROVINCE
Metro Toronto & Region	Snelgrove Reservoir	2,894.58	5.24	2,899.82	1,449.91	1,449.91
TOTALS		2,894.58	5.24	2,899.82	1,449.91	1,449.91

C16

WATER CONTROL PROJECTS

MISCELLANEOUS

Cost Sharing: Authority 50%/Ontario 50%

AUTHORITY	PROJECT	AUTHORITY	PROVINCE	TOTAL
Ausable/Bayfield	Port Frank—Emergency			
	Flood Control	273.75	273.74	547.49
Credit Valley	Mississauga—Appraisals	1,899.16	1,899.16	3,798.32
	Waterfront Study (Pt. Credit)	2,416.73	2,416.72	4,833.45
Grand River	Hanlon's Creek Ecological Study	5,106.70	5,106.69	10,213.39
Metro Toronto & Region	Hydro Power Base (Finch Dam)	628.90	628.89	1,257.79
TOTALS		10,325.24	10,325.20	20,650.44

C17

WATER CONTROL PROJECTS
PRELIMINARY ENGINEERING: FLOOD PLAIN MAPPING AND MISC.

Cost Sharing: Authority 25%/Ontario 75%

AUTHORITY	PROJECT	AUTHORITY	PROVINCE	TOTAL
Ausable/Bayfield	Ausable River & Mud Creek	1,375.00	4,125.00	5,500.00
Central Lake Ontario	Harmony, Farewell, Black and Corbett Creeks	1,160.15	3,480.42	4,640.57
Credit Valley	Cooksville Creek	500.00	1,500.00	2,000.00
	Credit River (Orangeville)	1,225.43	3,676.30	4,901.73
Grand River	Downey Road Dam	78.67	236.01	314.68
	Fairchild's Creek	4,489.55	13,468.61	17,958.16
	Flood Protection (City of Brantford)	554.43	1,663.23	2,217.66
	Grand River Watershed	1,323.73	3,971.16	5,294.89
	Guelph Dam	53,575.18	160,725.85	214,301.03
	Hanlon's Creek	500.00	1,500.00	2,000.00
	Hydrometric Survey	829.30	2,487.90	3,317.20
	Laurel Creek Dam	43.76	131.27	175.03
	Nith River (Town of Paris)	1,425.28	4,275.78	5,701.06
	Reservoir & Flood Plain Lands	2,600.80	7,798.41	10,399.21
	Sedimentation Survey	93.75	281.25	375.00
	Speed River at Hespeler	1,137.85	3,413.49	4,551.34
	Stream Bank Protective Measures	384.48	1,153.43	1,537.91
	Whiteman's Creek	535.25	1,605.72	2,140.97
Halton Region	Appleby Creek	1,227.07	3,681.16	4,908.23
	Hager-Rambo Creek	3,383.60	10,150.77	13,534.37
	Sixteen Mile Creek	973.10	12,919.31	3,892.41
	Twelve Mile and Grindstone Creeks	2,553.87	7,661.62	10,215.49
Hamilton Region	Ancaster Township	42.70	128.10	170.80
	Dundas Stream Flow Improvement	1,008.75	3,026.25	4,035.00
	Spencer Creek	84.85	254.54	339.39
Junction Creek	Junction Creek (Sudbury)	2,281.62	6,844.86	9,126.48
Lakehead Region	Current & McIntyre Rivers	57.24	171.75	228.99
	Kaministiquia, Neebing & McIntyre Rivers	1,749.99	5,249.98	6,999.97
	McVicar's Creek	1,791.56	5,374.69	7,166.25
	Onion Lake Dam	4,161.37	12,484.16	16,645.53
Lakehead Region	Water Use Study	824.88	2,474.69	3,299.57
Long Point Region	Sundry Creeks	179.05	537.15	716.20
Lower Thames Valley	McGregor's Creek	2,616.71	7,850.11	10,466.82
	Thames River	8,128.37	24,385.12	32,513.49
	Tilbury (Town)—Flood Relief	725.93	2,177.80	2,903.73
Mattagami Valley	Town Creek	5,598.42	16,795.27	22,393.69
Metro Toronto & Region	Don River	662.73	1,988.17	2,650.90
	Emery Creek	705.01	2,115.00	2,820.01
	Humber River	3,772.98	11,318.91	15,091.89

Mississippi Valley	Carp River	1,890.90	5,672.69	7,563.59
	Carp and Mississippi Rivers	2,065.47	6,196.43	8,261.90
Napanee Region	Camden East	1,117.19	3,351.54	4,468.73
	Hungry Lake	1,541.38	4,624.12	6,165.50
	Thirteen Island Lake Dam	960.57	2,881.68	3,842.25
Nottawasaga Valley	Collingwood South	621.89	1,865.67	2,487.56
	Hockley Valley	250.00	750.00	1,000.00
	Lamont Creek	599.57	1,798.73	2,398.30
	Pretty River	1,376.39	4,129.14	5,505.53
Otonabee Region	Baxter Creek Dam	2.91	8.73	11.64
Raisin Region	Glendale Weir	388.23	1,164.67	1,552.90
	Martintown Dam	227.09	681.29	908.38
Rideau Valley	North Augusta Reservoir	1,987.04	5,961.10	7,948.14
	Rideau and Ottawa Rivers (Village of Kars)	1,126.67	3,380.00	4,506.67
	Rideau & Ottawa Rivers	257.45	772.35	1,029.80
	Steven's Creek	1,475.35	4,426.02	5,901.37
	Tay River	1,558.21	4,674.57	6,232.78
Sault Ste. Marie Region	East Davignon Creek	12,966.90	38,900.74	51,867.64
	Fort Creek	1,064.98	3,194.95	4,259.93
South Lake Simcoe	Aurora and Newmarket	39.99	119.98	159.97
	Holland Valley (East Gwillimbury)	24.24	72.72	96.96
	Pleasantville Reservoir	126.24	378.75	504.99
	Schomberg River	520.38	1,561.16	2,081.54
Sydenham Valley	Dresden Diking	1,729.71	5,189.15	6,918.86
	Wallaceburg (Wallace St.)	112.07	336.20	448.27
	Wilkesport Diversion	3,651.57	10,954.73	14,606.30
Upper Thames River	Thames River	3,162.41	9,487.22	12,649.63
Whitson Valley	Balfour Township	275.00	825.00	1,100.00
	Montee—Principal Bridge	1,500.00	1,500.00	3,000.00
TOTALS		156,982.21	467,942.57	624,924.78

C18

WATER CONTROL PROJECTS
FLOOD WARNING SYSTEMS

Cost Sharing: Authority 50%/Ontario 50%

AUTHORITY	PROJECT	AUTHORITY	PROVINCE	TOTAL
Lower Thames Valley	Lower Thames River	38.55	38.54	77.09

C19

WATER CONTROL PROJECTS
MISCELLANEOUS RECONSTRUCTION

Cost Sharing: Province 100%

AUTHORITY	PROJECT	TOTAL
South	Scanlon	
Lake Simcoe	Creek Dam	18,842.41

C20

AUTHORITY WATER CONTROL PROJECTS

SMALL RESERVOIR PROGRAM

Cost Sharing: Authority 25%/Ontario 75% or: Authority 25%/Ontario 37½%/Federal 37½%

AUTHORITY	PROJECT	LAND	ENGINEERING	CONSTN	TOTAL	AUTHORITY	PROVINCE	FEDERAL
Catarqui Region	Little Catarqui Creek	10,218.65		31,623.26	41,841.91	10,460.48	15,690.71	15,690.72
	Temperance Lake Dam	557.50			557.50	139.37	418.13	
Credit Valley	Orangeville Dam			1,609.66	1,609.66	402.42	1,207.24	
Crowe Valley	Allan's Mill Dam			58,747.13	58,747.13	14,686.79	44,060.34	
Grand River	Floradale, Upper Floradale and Woolwich Dams			32,942.70	32,942.70	8,235.68	24,707.02	
	Ganagagigue Dam	57,251.68			57,251.68	14,312.92	42,938.76	
	Shades Mill Dam			29,626.82	29,626.82	7,406.72	22,220.10	
Halton Region	Hilton Falls Reservoir			131,731.41	131,731.41	32,932.85	98,798.56	
	Scotch Block Reservoir			130,268.10	130,268.10	32,567.04	97,701.06	
Hamilton Region	Christie Dam & Reservoir	22,792.28		247,379.72	270,172.00	67,542.99	202,629.01	
	Red Hill Creek Dam	9,269.17			9,269.17	2,317.29	6,951.88	
Junction Creek	Frood Reservoir			14,120.00	14,120.00	3,530.00	10,590.00	
	Maley Reservoir			1,169,059.10	1,169,059.10	292,264.78	441,984.92	434,809.40
	Nepahwin Reservoir	5,963.23		17,936.19	23,899.42	5,974.86	17,924.56	
	Nickeldale Reservoir			7,594.14	7,594.17	1,898.53	5,695.61	
	South East Shore Reservoir	4,316.60			4,316.60	1,079.15	3,237.45	
Lower Thames Valley	Sharon Creek Dam			567.26	567.26	141.82	425.44	
Lower Trent Region	Warkworth Dam			47,594.97	47,594.97	11,898.75	35,696.22	
Maitland Valley	Gorrie Dam			5,657.90	5,657.90	1,414.48	2,121.70	2,121.72
Napanee Region	Arden Dams			6,656.65	6,656.65	1,664.16	2,496.24	2,496.25
	Lonsdale Weir		591.82	8,497.10	9,088.92	2,272.24	3,408.34	3,408.34
	Third Depot Lake Dam	3,956.40		15,635.40	19,591.80	4,897.96	7,561.70	7,132.14
	Third and Fourth Depot Lake			142,913.15	142,913.15	35,727.97	55,055.91	52,129.27
	Varty Lake Dam			155.60	155.60	38.91	58.34	58.35
Niagara Peninsula	Binbrook Reservoir	5,497.24		1,145,716.91	1,151,214.15	287,803.56	863,410.59	
	Fifteen and Sixteen Mile Creek Weirs			3,345.30	3,345.30	836.33	2,508.97	
	Virgil Reservoir	7,395.89		1,093.84	8,489.73	2,122.43	6,367.30	
North Grey Region	Haines Reservoir	1,484.15			1,484.15	371.04	955.76	157.35
Nottawasaga Valley	Tottenham Dam			2,769.20	2,769.20	692.30	1,038.45	1,038.45
Otonabee Region	Hope Dam	494.57		884.87	1,379.44	344.88	1,034.56	
	Lang Dam			5,948.70	5,948.70	1,487.18	4,461.52	
Raisin Region	Long Sault Diversion	1,887.47		26,333.41	28,220.88	7,055.22	21,165.66	
	Lunenburg Diversion		243.95		243.95	60.99	182.96	
Rideau Valley	Bellamy Pond			2,689.15	2,689.15	672.28	2,016.87	
	Heart's Desire Weir	6,083.18	1,416.82		7,500.00	1,875.01	5,624.99	
	Richmond Weir			2,482.65	2,482.65	620.67	930.99	930.99
South Nation River	Russell Reservoir	5,420.78			5,420.78	1,355.20	4,065.58	
Sydenham Valley	Coldstream Dam & Reservoir			180.00	180.00	45.00	135.00	
	Morragh Creek Dam			2,449.47	2,449.47	612.37	1,837.10	
	Warwick Dam and Reservoir	2,906.53		148,258.45	151,164.98	37,791.23	113,373.75	
Trenton (Town)	Mayhew Creek Dam			43,330.65	43,330.65	10,832.65	16,249.00	16,249.00
Upper Thames River	Springbank Dam			43,275.08	43,275.08	10,818.77	32,456.31	
TOTALS		145,495.32	2,252.59	3,529,073.94	3,676,821.85	919,205.27	2,221,394.60	536,221.98

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